(21,273.)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1909.

No. 209.

DIAMOND RUBBER COMPANY OF NEW YORK, PETITIONER,

vs.

CONSOLIDATED RUBBER TIRE COMPANY AND RUBBER TIRE WHEEL COMPANY.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT.

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United States Circuit Court of Appeals for the Second Circuit.

THE CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,
vs.
THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Transcript of Record.

Appeal from the Circuit Court of the United States for the Southern District of New York.

Printed Under the Direction of the Clerk.

Circuit Court of the United States, Southern District of New York.

In Equity. No. —.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Bill of Complaint.

To the Honorable the Judges of the Circuit Court of the United States in and for the Southern District of New York:

1. Consolidated Rubber Tire Company, a corporation duly organized and existing under the Laws of the State of New Jersey, and a citizen of said state, and The Rubber Tire Wheel Company, a corporation organized and existing under the Laws of the State of Ohio and a citizen of said last named state, bring their bill of complaint against Diamond Rubber Company of New York, a corporation duly organized and existing under the Laws of the State of New York, and a citizen of said last named state, having a regular and established place of business at 78 Reade Street, New York, in the Southern District of New York in which District the acts of infringement hereinafter complained of were committed.

2. And thereupon your orators complain and say that prior to the 14th day of November, 1895, Arthur W. Grant was the true, original and first inventor of certain new and useful improvements in rubber tired wheels, which had not been known or used by others before his invention thereof and not patented or described in any printed publication in this or any foreign country before his invention thereof or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application, and not abandoned.

3. And your orators further show that the said Arthur W. Grant

so being the inventor of said improvements, made application to the proper department of the Government of the United States for letters patent therefor in accordance with the then existing Acts of Congress, and he having duly complied in all respects with the conditions and requirements of said Acts, such proceedings were had that on the 18th day of February, 1896, Letters Patent of the United States for said improvement and invention, under the seal of the Patent Office of the United States, signed, sealed and executed in due form of law, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, were issued to him for said invention and numbered 554,675, whereby was granted and secured to the said Arthur W. Grant, his heirs and assigns, for the term of seventeen years from the day of the date thereof, the full and exclusive right of making, using, and vending to be used, the said improvements and invention, a description whereof is given in the words of said inventor in writing, accompanied by drawings and references thereto, duly annexed to said letters patent, which said letters patent is now of record in the Patent Office of the United States, and a duly certified copy of which is ready here in Court to be produced, a Patent Office copy of the same being attached hereto, marked "Exhibit A," and is made a part hereof.

4. Your orators further show that on the 7th day of November, 1895, and before the issue of said letters patent, by virtue of, under and through a certain instrument in writing, duly executed and delivered by said Arthur W. Grant on the last-named day, and duly recorded in the Patent Office of the United States on the 6th day of February, 1896, your orator The Rubber Tire Wheel Company, became the sole and exclusive owner of the said invention and improvements, and the owner of the entire right, title and interest in and to the aforesaid letters patent, and, since the execution and delivery of the aforesaid instrument in writing, your orator The Rubber Tire Wheel Company has been and now is the owner of the exclusive right of making, using and vending to others to be used, the improvements and invention described in the aforesaid letters patent for, to, and in the whole of the United States, as by said assignment or a duly certified copy thereof to be produced in court will fully appear, subject to the rights of said Consolidated Rubber Tire Company as hereinafter fully shown.

5. Your orators further show that the said invention and improvements, patented as aforesaid, have hitherto been in the exclusive possession of the said patentee or his assigns, and have hitherto been and still are of great profit and value to your orators; that said invention and improvements have been largely introduced into public use by your orators, and for this purpose they have established a large number of branches of their business in various parts of the United States and are well equipped to furnish to the public rubber tires or rubber-tired wheels in accordance with said letters patent; and, further, they have granted a large number of licenses to other manufacturers to make and sell the invention, and your orators' rights thereto have been acquiesced in by the public, and but for the infringement here-

inafter complained of, and some others of like character, your orators would now be in the undisturbed possession and enjoyment of the exclusive privileges secured by said letters patent.

6. Your orators further show that on or about July 18th, 1899, said Rubber Tire Wheel Co. sold, assigned and transferred to said Consolidated Rubber Tire Co. the exclusive right, license and authority to make and vend rubber tires under the said invention, and said letters patent No. 554,675, and said Consolidated Rubber Tire Co. then began the business of selling rubber tires throughout the United States, and has ever since continued to sell rubber tires of the kind described in said letters patent; and your orators, Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, further show that they are now the owners of all right, title and interest in and to said letters patent and in and to all claims and demands for damages or profits accrued or to accrue by reason of the infringement thereof.

7. And your orators further show that they have caused the devices made and sold by them under said letters patent as set forth in the last preceding paragraph hereof to be marked "Patented" with the date of said letters patent in accordance with the statute of the United States in such case made and provided.

8. Your orators further show that in February, 1905, they brought suit in the Circuit Court of the United States for the Southern District of New York against the Firestone Tire & Rubber Company for infringement and violation of the rights of your orators under said letters patent. That said Firestone Tire & Rubber Company defended said suit and therein denied the validity of said patent, and also the infringement thereof, and denied the title of complainants to said letters patent, and said cause came on to be heard upon pleadings and proofs before Hon. James P. Platt, District Judge, May 21st, 1906, and was argued by counsel for the respective parties, and on August 20th, 1906, said Circuit Court ordered a decree for complainants, adjudging said patent and both claims thereof to be valid, and that the complainants were the owners thereof, and that said Firestone Tire & Rubber Company infringed the same, and decreed an accounting for profits and damages. From said decree said Firestone Tire & Rubber Company appealed to the United States Circuit Court of Appeals for the Second Circuit, and said appeal came on to be heard upon the pleadings and proofs January 7th, 1907, before Judges Lacombe, Townsend and Coxe, and was then argued upon the pleadings and proofs, and on February 1st, 1907, said Circuit Court of Appeals ordered a decree for complainants herein, affirming the decree of said Circuit Court and affirming the validity of said letters patent No. 554,675, and both claims thereof, and adjudging the same to be infringed by the defendant.

Your orators further aver that said letters patent No. 554,675 has been the subject of litigation as specifically set forth in the decision of the United States Court of Appeals for the Second Circuit above mentioned, and as will more fully and at large appear by reference to the records thereof, to which records or to duly authenticated copies

thereof complainants beg leave to refer when, and as often as may be necessary.

9. And your orators further show, on information and belief, that the defendant Diamond Rubber Company of New York has recently and before the filing of this bill of complaint, with full knowledge of your orators' rights, wilfully and deliberately manufactured or caused to be manufactured, and sold for use and sale within this Judicial District, and is now manufacturing, or causing to be manufactured, selling and offering and advertising for use and sale within this Judicial District, rubber tires embodying the invention set forth in claims 1 and 2 of the said Letters Patent No. 554,675, in violation and infringement of the aforesaid rights and privileges of your orators and is threatening to continue so to do; that the said manufacture, use and sale by said defendant of the said rubber tires was and is deliberate, unlawful, wrongful, and without license or permission of your orators, and in defiance of your orator's rights; but how many of said rubber tires the said defendant, Diamond Rubber Company of New York, has manufactured or caused to be manufactured, used or sold, and is now manufacturing or causing to be manufactured, selling or using, your orators are ignorant and cannot set forth, but they aver that the defendant is deriving and receiving, and has derived and received from such manufacture, use and sale, great gains and profits, but to what amount your orators are ignorant and cannot set forth, but pray that the defendant may be required to make full disclosure of all such gains and profits.

10. And your orators further show, on information and belief, that the said infringing rubber tires so manufactured and sold by the said defendant herein, and complained of herein, are in every respect identical with the rubber tires the manufacture and sale of which were inhibited by the injunction granted by the United States Circuit Court of Appeals for the Second Circuit as set forth in paragraph eight hereof.

11. And your orators further show that they have caused notice to be given to the said defendant of such infringement upon the rights of your orators in the premises and have requested it to desist therefrom, but said defendant has disregarded said notice and has refused to desist from said infringement and continued its said infringement after the date of said notice.

12. And your orators further aver, on information and belief that the defendant deliberately and wilfully threatens and intends to continue said infringement, and is prepared and ready so to do, and that unless said defendant is restrained from said infringement, your orators will suffer great and irreparable loss and damage, for which they have no adequate redress at law.

13. Your orators further aver the said letters patent No. 554,675 are of great value and importance to the complainants, who have spent large sums of money in defending the same and in building up a trade thereunder, and that rubber tires made thereunder are very largely used and are of great utility to the public and profit to complainants, and your orators fear, and have reason to fear that unless the defendant be restrained by writ of injunction issuing out

of this court, it will continue to practice and use said invention by making, vending and using rubber tires covered by said letters patent, and to deprive your orators still further of the gains, profits and advantages which would otherwise accrue to them.

14. And forasmuch as your orators can have no adequate relief, except in this Court, and to the end that the defendant may, if it can, show cause why your orators should not have the relief herein prayed for, and may, but not upon oath (oath to the defendant's answer being hereby waived), according to its best and utmost knowledge, remembrance, information and belief, full, true, direct and perfect answer make, to all and singular the premises, and that the said defendant may be compelled to account for and pay unto your orators the profits it has unlawfully derived or which it might have derived, from the violation of the rights of your orators, as above, as well as the damages therefor, and be restrained from any further violation of said rights, your orators pray that your Honors may grant writs of injunction, restraining the defendant Diamond Rubber Company of New York, its associates, officers, servants, agents, attorneys, clerks and workmen and every person acting for and on behalf of the said defendant, from any further manufacture, use or sale of rubber tires in violation of the rights of your orators as aforesaid, and also that your Honors, upon the rendering of a decree for infringement, as above prayed for, may proceed to assess, or cause to be assessed, under your Honor's direction, in addition to the gains and profits to be accounted for by the defendant, the damages your orators have sustained by reason of the said infringement; that your Honors may increase the actual damages so assessed to a sum equal to three times the amount of such assessment, in view of the wilful and deliberate infringement by the defendant as herein set forth.

15. And your orators pray also for a provisional or preliminary injunction during the pendency of this suit, to be issued out of and under the seal of this Honorable Court, enjoining and restraining the said defendant, its associates, officers, servants, agents, attorneys and workmen, and each of them, during the pendency of this cause, from directly or indirectly manufacturing, using or selling, shipping or otherwise disposing of rubber tires in infringement of said Letters Patent No. 554,675, granted February 18, 1896, to Arthur W. Grant, and from advertising for use and sale or disposing of said infringing rubber tires.

16. And your orators further pray that the said defendant may be decreed to pay the cost of this suit, and that your orators may have such other and further relief as the equity of the case may require, and to this Honorable Court may seem meet.

17. May it please your Honors to grant unto your orators a writ of injunction, conformable to the prayer of this bill; and also a writ of *subpœna ad respondendum* issuing out of and under the seal of this Honorable Court, directed to Diamond Rubber Company of New York and commanding it, on a certain day, and under a certain penalty to appear before this Honorable Court, then and there to answer the foregoing bill and to abide by and perform such orders

and decrees in the premises as to the Court shall seem meet and be required by the principles of equity and good conscience.

And your orators will ever pray.

CHARLES W. STAPLETON,
Solicitor for Complainant, 220 Broadway,
Borough of Manhattan, New York, N. Y.

STALEY & BOWMAN,
THOMAS W. BAKEWELL,
Of Counsel.

STATE AND COUNTY OF NEW YORK, *ss:*

Van H. Cartmell, being duly sworn, says that he is the President of plaintiff the Consolidated Rubber Tire Company, and that all of the material allegations of the foregoing complaint are within the personal knowledge of deponent.

That the foregoing complaint is true to the knowledge of deponent except as to the matters therein stated to be alleged on information and belief, and that as to those matters he believes it to be true.

And deponent further says that he verily believes the said Arthur W. Grant to be the original, sole and first inventor of the new and useful invention described and claimed in the letters patent named in said bill, and that complainants' title to said letters patent is as set forth in said bill.

VAN H. CARTMELL.

Subscribed and sworn to before me this 10th day of June, 1907.

ADELE V. JUILLERAT,
Notary Public, New York County.

United States Circuit Court, Southern District of New York. In Equity.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY
vs.
DIAMOND RUBBER COMPANY OF NEW YORK.

The Joint and Several Replication of the Above-named Complainants to the Answer of the Above-named Defendant.

These replicants jointly and severally saving and reserving to themselves all, and all manner of advantage of exception which may be had and taken to the manifold errors, uncertainties and insufficiencies of the answer of said defendant for replication thereto, say, that they do and will ever maintain and prove their said bill to be true, certain and sufficient in the law to be answered unto by said defendant, and that the answer of said defendant is very uncertain, evasive and insufficient in the law to be replied unto by these replicants; without that, that any other matter or thing in the said an-

swer contained material or effectual in the law to be replied unto and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed, or denied, is true; all of which matters and things these replicants are ready to aver, maintain and prove as this honorable Court shall direct, and humbly pray as in and by said bill they have already prayed.

CHAS. W. STAPLETON,
Solicitor for Complainants,
220 *Broadway, New York, N. Y.*

THOS. BAKEWELL,
STALEY & BOWMAN,
Of Counsel.

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
vs.
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

NEW YORK, *July 23d*, 1907.

Deposition of witnesses taken in the above-entitled cause on behalf of the complainants before John A. Shields, Esq., Standing Examiner, at the office of Charles W. Stapleton, No. 220 Broadway, New York, pursuant to notice heretofore given, and in accordance with equity rules, beginning at 10:30 a. m., Tuesday, July 23d, 1907.

Present: Charles W. Stapleton, Esq., for Complainants. Philip B. Adams, Esq., for Defendant.

On application of defendant's counsel, it is agreed that the taking of testimony under this notice and offering of exhibits and proofs under this notice be adjourned until Thursday, July 25th, 1907, at the same hour and place mentioned in said notice.

NEW YORK, *July 25th*, 1907.

Met pursuant to adjournment at the office of Charles W. Stapleton, 220 Broadway, New York City.

Present: Thomas Bakewell, Esq., and Charles W. Stapleton, Esq., Counsel for Complainants; Charles K. Offield, Esq., and Philip B. Adams, Esq., Counsel for Defendant.

Complainants' counsel offers in evidence a certified copy of United States Letters Patent No. 554,675, issued to Arthur W. Grant, February 18th, 1896, for rubber tired wheel.

Received in evidence and marked Complainants' Exhibit, "Complainants' Patent."

Defendant's counsel objects to the introduction of this exhibit at this time for the reason that this case as to entire subject-matter is now pending on appeal upon record made in the United States Cir-

cuit Court of Appeals for the Second Circuit, and that it is immaterial and irrelevant as to any testimony that may now be taken in this case pending said appeal and pending a predetermined application for a writ of certiorari to the Supreme Court of the United States as to this case whatever may be the decision by the Circuit Court of Appeals for the Second Circuit, and certainly if the decision of such Circuit Court of Appeals shall be adverse to the defendant herein.

Complainants' counsel further offers in evidence a certified copy of an assignment of the patent in suit, dated November 7th, 1895, recorded February 6th, 1896, in Liber V-52, at page 272, in the Patent Office.

Received and marked Complainants' Exhibit, "First Assignment."

Defendant's counsel objects to this paper as incompetent, irrelevant and immaterial and without due proof either as to the execution or an alleged witness thereof, and further without any proof or the slightest proof that the paper marked Complainants' Exhibit, Complainants' Patent is the paper or patent contemplated or intended by the certificate of the Patent Office of the typewritten copy attached thereto, and for the further reason that this paper last offered in evidence, as appears from the paper itself, did not and cannot contemplate the exhibit marked Complainants' Exhibit, Complainants' Patent.

Complainant's counsel further offers a certified copy of assignment of the patent in suit from Arthur W. Grant to the complainant the Rubber Tire Wheel Company, dated December 3d, 1897, recorded December 9th, 1897, in Liber I-56, page 454, in the Patent Office.

Received in evidence and marked Complainants' Exhibit "Second Assignment."

Defendant's counsel objects to this exhibit as incompetent, irrelevant and immaterial, without due proof of execution or delivery, and because the same professes to recite an alleged condition of fact on its face not proven or capable of being proven in this case.

Thereupon Mr. ROBERT SOUTHARD, a witness produced on behalf of the complainants, being first duly sworn, deposes and testifies as follows in answer to questions put by Mr. Stapleton:

Q. 1. State your name, age, place of residence and occupation?

A. Robert Southard; age, 33; residence, 347 East 57th Street; occupation, cab owner and driver.

Complainants' counsel here produced a rubber tired wheel.

Q. 2. Do you recognize the wheel and tire which I now show you?

Defendant's counsel objects to the deposition and testimony of this witness upon the grounds stated in the first objection entered herein and without detailed repetition.

A. Yes, sir.

Q. 3. You may state what connection you had with this wheel and tire?

A. I took the wooden wheel from the Consolidated Rubber Tire Company to the uptown branch of the defendant, the Diamond Rubber Company of New York the 28th of February, 1907. I told them I wanted a tire put on—a tire and channel—to fit the wheel.

Q. 4. What did they say?

A. I asked them a price—they said they would do it and have it ready by the first of the month. I went and got the wheel on the 1st of March and delivered it to the Consolidated Rubber Tire Company.

Q. 5. Did they present a bill for putting on the rubber tire?

A. Yes, sir.

Q. 6. Did you pay it?

A. Yes, sir.

Q. 7. Who did you see when you first went to the defendant to get the tire applied to the wheel?

A. A clerk; I don't know his name.

Q. 8. Was this the regular place of business of the defendant here in New York?

A. Yes, sir.

Q. 9. State, if you can, who you saw or talked with when you received the wheel on March 1st?

A. I don't know who it was, it was the same man to whom I delivered the wheel; I don't know his name.

Q. 10. Do you know this place where you delivered and received this wheel to be the regular place of business of the defendant in New York, where they apply rubber tires?

A. Yes, sir.

Q. 11. In what condition was this wheel when you delivered it to the defendant, that is, state whether or not it had on any steel channel or rubber tire?

A. The plain wooden wheel, when I delivered it.

Q. 12. When it was returned to you in what condition was it?

A. With the steel and rubber tire applied.

Q. 13. The same as it is now except for the parts that have been cut out?

A. Yes, sir.

Q. 14. How do you recognize this particular wheel?

A. I recognize it by the painting and my own mark and name, Robert G. Southard marked on the tire with indelible ink.

Q. 15. Did you mark your name on the tire that is now shown?

A. Yes, sir.

Q. 16. When did you do that?

A. March 1st when I received the wheel from the defendant.

Q. 17. I understand that when the wheel was delivered to you by the defendant the tire was complete and the wheel was in condition for use and was entirely encircled with the steel channel and rubber tire; is that correct?

A. Yes, sir.

Q. 18. You may state if, subsequent to your receiving the wheel, you had any conversation about this wheel with anyone, and if so,

with whom and when. I refer to any conversation which you may have had with the officers or employees of the defendant.

Objected to, as the witness has stated, or his deposition shows he knows nothing about the officers of the defendant or has he shown any knowledge as to who the employees of the defendant were.

A. Mr. Williams, of the Diamond Rubber people, I met at 47th Street and Sixth Avenue. He asked me if I was Robert Southard; I told him I was; he wanted to know if I had a tire put on by the Diamond Rubber Company; I told him I did; he asked me if I'd have a drink; I said certainly. We went into Meyer's cafe, 47th Street and Sixth Avenue. He wanted to know how I liked the tire and the wearing qualities of the tire. I told him all right. He wanted to know if the Consolidated Rubber Tire Company sent me with the wheel or if I had it put on myself. I told him I took the wheel and had the tire put on.

Q. 19. Did he say who he was at any time in this conversation?

A. He said he was the manager of the uptown branch and his name was Mr. Williams.

Cross-examination by Mr. OFFIELD, subject to the entered objections:

X Q. 20. The Consolidated Rubber Tire Company which gave you this wheel to be channeled and rubber-tired is the complainant in this case, is it not?

A. Yes, I believe so.

Defendant's counsel inquires of complainants' counsel if this fact is admitted.

COMPLAINANTS' COUNSEL: It is admitted.

And complainants' counsel now offers the wheel and rubber tire and channel steel in evidence, and asks that the same be marked Complainants' Exhibit, "Defendant's Rubber Tire."

Recorded in evidence and so marked.

X Q. 21. You are the same Robert Southard who made an affidavit in this case, subscribed and sworn to June 10th, 1907, before Samuel D. Shirk, are you not?

A. Yes, sir.

X Q. 22. This exhibit wheel, when you took it to the office of the defendant was the property of the Consolidated Rubber Tire Company?

A. Yes, sir. That's where I got the wheel, I suppose it was theirs.

X Q. 23. The wheel never belonged to you and you never had any interest in it at any time, did you?

A. No, sir.

X Q. 24. Did the Consolidated Rubber Tire Company direct you what kind of a tire and what kind of a rim to have placed on this wheel exhibit?

A. No, sir.

X Q. 25. You knew when you took the wheel the kind of a rim

and the kind of a tire you were to order to be placed on that wheel by the defendant, didn't you?

Objected to as wholly incompetent, immaterial and irrelevant. The witness' knowledge on that point is not of the slightest consequence in this case.

A. I told him I wanted the Diamond tire and channel.

X Q. 26. And you told them that because you knew that that was the tire and channel that the Consolidated Rubber Tire Company wanted on the wheel, did you not?

Objected to on the same ground as raised to the last question.

A. Yes, sir.

X Q. 27. Now, the next time you saw that wheel it was in the same condition that it is as an exhibit before you, except for the mutilated parts, was it not?

A. Yes, sir.

X Q. 28. When you received that wheel exhibit, you knew, the moment you saw it, that it was what the Consolidated Rubber Tire Company wanted and sent you to get?

Objected to on the ground and that the witness' knowledge as to what the Rubber Tire Company wanted or didn't want is immaterial provided the witness had any knowledge on the subject.

A. Yes, sir.

X Q. 29. Did you take this wheel exhibit directly from the defendant's office or place of business to the Consolidated Rubber Tire Company's office or agent or attorneys in this City?

A. I delivered it right away to the Consolidated Rubber Tire Company.

X Q. 30. In this City?

A. In this City.

X Q. 31. Whereabouts in this City?

A. 243 West 47th Street.

X Q. 32. Who paid for this wheel that has been marked Complainants' Exhibit, Defendant's Rubber Tire?

Objected to as immaterial and irrelevant and that it already appears that the witness paid for it himself.

A. I paid for it myself.

X Q. 33. Yes, you passed over the money for that to the defendant, but where did you get the money to pay for the wheel?

Objected to as immaterial and irrelevant.

A. Mr. Roberts of the Consolidated Rubber Tire Company.

X Q. 34. Then the Consolidated Rubber Tire Company paid for this addition to this exhibit that they had directed you to buy?

Objected to as immaterial and irrelevant.

A. Mr. Roberts gave me the money to pay for the wheel and I paid it and got a receipt for it.

X Q. 35. With the same money given you by Mr. Roberts?

A. I don't know whether it was the same money or not.

X Q. 36. You found out what the equipped wheel exhibit was going to cost the first time you gave the wheel to the defendant, did you not?

A. I did, I made a price with the Diamond Rubber Tire Company.

X Q. 37. And then you reported this price to the Consolidated Rubber Tire Company and they gave you the money through Mr. Roberts, is that it?

A. Not until after I returned the wheel.

Defendant's counsel again objects to the deposition of this witness as incompetent, irrelevant and immaterial, and that the testimony of this witness, under the law of *invinto domino* is incompetent to establish any act or deed of infringement or wrong upon the part of this defendant and he declines to cross-examine further.

Redirect Examination by Mr. STAPLETON:

R. D. Q. 38. This wheel exhibit seems to have a section cut out, on which there is in raised letters the words, "Made in Ohio, U. S. A. by the Diamond Rubber Co. 15⅝." Do you recognize that section as a part of the rubber tire which was furnished you by defendant?

A. It has the same marking that the tire had when I returned the wheel to the Consolidated Rubber Tire Company.

Recross-examination by Mr. OFFIELD:

R. X Q. 39. The Consolidated Rubber Tire Company themselves manufacture tires and sell them on the market like the rubber tire on this wheel exhibit, do they not, and sell such tires generally to go on all kinds of wheels, do they not?

A. I believe they do with their own name on the tire.

R. X Q. 40. And the Consolidated Rubber Tire Company, complainant, manufactures and sells to the trade in this City, or at least sell to the trade, channel irons to be bent in the form of the steel channel iron upon wheels shown in this wheel exhibit; do they not?

Objected to as immaterial.

A. I believe they do.

ROBERT G. SOUTHARD.

Deposition Closed.
Recess until 2:30 P. M.

After recess, 2:45 P. M.

Thereupon, FREDERICK A. SEAMAN, a witness produced on behalf of the complainants, being first duly sworn, deposes and testifies as follows, in answer to questions put by Mr. STAPLETON:

Q. 1. What is your name, age, residence and occupation?

A. Frederick A. Seaman; age, 44 years; residence, Madison, New Jersey; occupation, Secretary and Treasurer of the Consolidated Rubber Tire Company of New Jersey and the Rubber Tire Wheel Company of Ohio.

Q. 2. You may state whether or not you are familiar with the business and affairs of complainants?

Defendant's counsel objects to the testimony of this witness in this case at this time for the reason that the case is now pending upon the certified record in the Circuit Court of Appeals of the United States for the Second Circuit and with the avowed intention as disclosed by that record to remove the case to the Supreme Court of the United States by writ of certiorari in view of the difference of results as to the validity of the patent in suit in the Court of Appeals of the Sixth and Second Circuit, and the difference of results in the Circuit Court of the United States for the District of Indiana.

A. I am.

Q. 3. What right or interest, if any, has the Consolidated Rubber Tire Company in and to the patent in suit?

Defendant's counsel objects as of necessity to any such interest must be in writing, and the writing is the best evidence.

A. I understand it is the joint owner with the Rubber Tire Wheel Company, the two companies own it together.

Q. 4. When did the transfer of the interest from the Rubber Tire Wheel Company to the Consolidated Company occur?

Last objection repeated.

A. About July, 1899.

Q. 5. Was there any written transfer of the patent from the Rubber Tire Wheel Company to the Consolidated Company?

A. No, there was not any written transfer of the patent. The title or record stands in the name of the Rubber Tire Wheel Company, but about July, 1899, the Consolidated Rubber Tire Company bought a large part of the assets in the Rubber Tire Wheel Company including an interest in the patent.

Q. 6. How was this done?

A. The Consolidated Rubber Tire Company became the owner of part of the capital stock of the Rubber Tire Wheel Company and without any particular action on the part of the Rubber Tire Wheel Company the Consolidated Company took possession about July, 1899, of the greater part of the assets and business of the Rubber Tire Wheel Company and has generally managed the business since then with the acquiescence of the Rubber Tire Wheel Company and with their knowledge and consent, including the patent.

Q. 7. Then, I understand, in 1899 the Consolidated Company assumed control and a part or joint ownership of the patent in suit and with the knowledge, consent and acquiescence of the Rubber Tire Wheel Company it has since exercised practically the exclusive right to grant licenses and sell the patented invention; is that correct?

Objected to as leading and as not giving the witness an opportunity to state even an opinion, let alone the fact.

A. Yes, except that the Rubber Tire Wheel Company has frequently joined in these licenses.

Q. 8. Have you examined the defendant's tire and wheel? I refer to Complainants' Exhibit, Defendant's Tire.

A. Yes, I have examined it.

Q. 9. Will you please compare this exhibit with Figures 2 and 4 of the patent in suit, which I now hand you, and state wherein it resembles or wherein it differs from the construction shown in the figures of the drawing?

A. The construction appears to me to be identical in every particular.

Q. 10. How is it with respect to the other figures of the patent?

A. They appear to be identical also except that Figure 3 of the patent shows the joint of the wires, and I don't see it in the exhibit, as it appears to have been cut apart. I assume it was cut apart to show the interior construction of the tire and the method with which it was secured to the wheel.

Q. 11. Will you look at the defendant's wheel and state whether or not it has a metallic rim?

A. Yes, it has.

Q. 12. State whether the metallic rim has angularly projecting flanges?

A. It has.

Q. 13. And whether the channel or groove formed by these flanges have inclined sides?

A. Yes, they have.

Q. 14. State whether the rubber tire on said exhibit has the sides of its outer portion at an angle to the sides of the inner portion?

A. It has.

Q. 15. Is the angle or corner of the rubber above or below the periphery of the flanges?

A. The angles are below.

Q. 16. Do the retaining wires pass entirely through the inner portion of the tire?

A. They do.

Q. 17. Are the retaining wires above or below the outer portions of the channel?

A. Below.

Q. 18. What, if anything, is there on the bottom of the rubber?

A. A canvas strip.

Q. 19. How does that defendant's exhibit compare with the device as made and sold by the Consolidated Rubber Tire Company?

A. It appears to be identical in every respect.

Cross-examination by Mr. OFFIELD:

X Q. 20. Has the Rubber Tire Wheel Company of Ohio a place of business in that State?

A. It has, in Springfield, Ohio.

X Q. 21. What kind of a place of business is that?

A. It is its principal office.

X Q. 22. How many rooms in that office, at Springfield?

A. One room serves its purposes; it is simply a place where its

Board of Directors meet and stockholders' meetings are held at Springfield, Ohio.

X Q. 23. In what building is the office of the Rubber Tire Company of Ohio?

A. The Gottwald Building.

X Q. 24. What floor of the building and what is the number of the room?

A. I don't know the number of the room—I don't know whether it has a number or not.

X Q. 25. What furniture is there in the room of the office of the Rubber Tire Wheel Company of Springfield, Ohio?

A. The usual furniture found in any office.

X Q. 26. Does the Rubber Tire Wheel Company of Ohio own the furniture in its office?

A. It does not.

X Q. 27. Who does own it?

A. I don't know.

X Q. 28. Do you mean to say that you are Secretary and Treasurer of the Rubber Tire Wheel Company of Ohio, and that you don't know who owns the furniture?

A. I do. I did not say it was the furniture of the company.

X Q. 29. Does the Rubber Tire Wheel Company pay any rent for its office in Springfield, Ohio?

A. No, it does not.

X Q. 30. Who has charge of the office of the Rubber Tire Wheel Company at Springfield, Ohio?

A. One of the Vice-Presidents of the company is usually there.

X Q. 31. Give his name?

A. Paul A. Staley.

X Q. 32. He is one of the attorneys in this case, isn't he?

A. Yes.

X Q. 33. Any other officer of the Rubber Tire Wheel Company in Springfield, Ohio, or anywhere else in that State besides Mr. Staley?

A. Yes, Mr. J. E. Bowman, Vice-President.

X Q. 34. At Springfield, Ohio?

A. Yes.

X Q. 35. In the same office?

A. No, I think not.

X Q. 36. Any other Vice-President of the Rubber Tire Wheel Company at Springfield, Ohio, besides these two or anywhere else in Ohio?

A. No.

X Q. 37. Any other officer or manager of any description besides these two Vice-Presidents in Ohio, of the Rubber Tire Wheel Company?

A. Unless you consider Directors officers—no.

X Q. 38. Well, what Directors of the Rubber Tire Wheel Company of Ohio are there in Ohio and where do they live and what are their names?

A. Mr. Edwin S. Kelly, Mr. Border Bowman, both of whom reside in Springfield, Ohio.

X Q. 39. Any others?

A. No.

X Q. 40. What are your duties as Secretary and Treasurer of the Rubber Tire Wheel Company of Ohio?

A. The usual duties of a Secretary and Treasurer, the keeping of its records.

X Q. 41. Well, what records are there to keep of the Rubber Tire Wheel Company of Ohio?

A. Contracts, licenses, the minutes of the company and matters of that kind.

X Q. 42. The Rubber Tire Wheel Company neither manufacture, use, nor sell rubber tires, does it?

A. It is not actively in business now. The active business is conducted by the Consolidated Rubber Tire Company, as I believe I have stated.

X Q. 43. Please answer the question?

A. No, it is not manufacturing, selling or using now.

X Q. 44. Has the Rubber Tire Wheel Company ever granted any written license to the Consolidated Rubber Tire Company of New Jersey under the patent in suit?

A. No.

X Q. 45. You have intended to testify, have you, that the Consolidated Rubber Tire Company of New Jersey grants licenses under the patent in suit; is that right?

A. Yes, that's right.

X Q. 46. And that sometimes it joins in these licenses with the Rubber Tire Wheel Company of Ohio; is that right?

A. It is.

X Q. 47. You are familiar with the case of these two complainants against the Firestone Tire & Rubber Company, recently decided in the United States Circuit Court of Appeals for the Second Circuit, are you?

A. I am.

X Q. 48. Has complainants in this case or either of them granted any licenses under this Grant patent in suit since that decision?

A. It has not, except the shop rights, which it is continually granting all through the United States to parties who buy tires from us.

X Q. 49. What do you mean by this shop right? What is it?

A. In my understanding the difference between a shop right as I have just explained and an ordinary license under the patent, that we grant in a shop right near to one of our customers the privilege of applying our tires when purchased from us, while in a license, within my meaning, it would cover the right to manufacture, in addition, that is, to manufacture the tire itself and its component parts.

X Q. 50. What do you call a license from these complainants under the patent in suit?

A. I think I have just stated what a license is, in my understanding.

X Q. 51. Well, look at the transcript of record in the United States Circuit Court of Appeals of the Second Circuit in this case, and the printed document called an agreement with the names of the Consolidated Rubber Tire Company and the Rubber Tire Wheel Company, the two complainants in this case, printed in that record that I now hand you, between pages 49 and 65, inclusive, and state whether that is the license of these complainants which you have been telling about?

That is objected to as incompetent, irrelevant and immaterial, that any proposed license which the complainants may have contemplated is not a matter for consideration in this case, that the only evidence on which to justify the question is an alleged record made by the defendant in this case, much of which consists of affidavits stating gross untruths and irrelevant matter, all of which was placed in the record on appeal by the defendant in this case, and the alleged license agreement is evidently a fake, as it does not purport to be executed by anybody, and in fact was never executed, and is only in the case on appeal because attached to the affidavit of Mr. Harvey J. Woodward, who is the Manager and Secretary of the defendant company.

Defendant's counsel objects to this bald instruction to the witness as to a desired answer under the guise of an objection, and objects to it further because such objection is a direct contradiction of alleged facts sworn to by complainants' officers and affiant witnesses.

A. I haven't been talking about this license at all. I have been endeavoring to answer your question, which was that I should define my understanding between the difference of a shop right and a license.

X Q. 52. Well, talk about this license then to which your attention has just been called in the printed record. Is that a license gotten up and printed with the names of both complainants, printed as parties thereto and by those complainants since the decision in the Circuit Court of Appeals for the Second Circuit referred to?

Mr. STAPLETON: I object to it as incompetent, irrelevant and immaterial, that there does not appear before the witness any license, but only something that this defendant has printed, which he alleged was proposed as a license.

Defendant's counsel calls the attention of the Court to the fact that the Court has printed his record, and not defendant's counsel, and demands an answer to his question.

Complainants' counsel states, in answer to the last remark of defendant's counsel, that it was hardly necessary to put such a statement on the record, but it having been done, it is proper to also call the Court's attention to the fact that the Court printed only what the defendant got up and swore to on their side of the case, and of which the alleged license is only one paper.

A. It appears to be a license (interruption by Complainants' counsel stating, that it is not a license.) It appears to be a license or form of license, and it does have printed on page 65 the names of the complainant company, but there are no signatures attached and there

is no evidence in the copy which you handed me of its ever having been executed.

X Q. 53. This is a form of license that was gotten up for the complainant after the decision of the Court of Appeals of the Second Circuit; wasn't it?

Objected to as incompetent, irrelevant and immaterial.

A. I am sure I don't know whether it was or not.

X Q. 54. Will you as Secretary and Treasurer of the company, before the next session, to-morrow morning, bring with you the form of license that was gotten up by the complainant and printed after the decision of the Circuit Court of Appeals for the Second Circuit, so that the Court may know whether this part of the printed record exactly and precisely states such license, and, in fact, is a duplicate reproduction of such license?

Objected to as incompetent and improper, irrelevant and immaterial, and counsel instructs the witness that he is not required to do anything of the kind; that whatever action or license the complainants have proposed is immaterial and unimportant in this case, and the fact that an alleged form of license is in the papers on an appeal from an injunction doesn't make it material here.

A. Under advice of counsel I decline to do so.

X Q. 55. Have you any objection personally so to do or as an officer of the company?

A. No, simply on advice of counsel.

X Q. 56. Your counsel has seen fit to designate this printed copy of the complainants' license, printed in this United States Circuit Court of Appeals record as "fake license." Do you know what he meant by that, and do you see anything fake about this license?

Objected to on the ground that the witness is not shown to — an expert on "fakes."

A. I can't look into counsel's mind, and I have no opinion on the matter.

X Q. 57. Answer the other part of the question please, and state if you see anything "fake" in it?

A. I have no opinion on the matter.

X Q. 58. I was not asking your opinion, I was trying to get at a fact, and do you see anything fake about this printed license in the record?

Objected to as already answered.

A. I can't give you any other answer to that, sir.

X Q. 59. You know, do you not, that after the decision in the U. S. Circuit Court of Appeals we have been talking about, that there was a license drawn and printed covering this patent in suit, and to which was printed the names of both parties complainant?

Objected to as wholly incompetent, irrelevant and immaterial.

A. There was a proposed form of license printed.

X Q. 60. Is this license to which your attention has been called

in this U. S. Circuit Court of Appeals record, printed between pages 49 and 65, inclusive, is what you now state as the proposed license printed by the complainants after the U. S. Circuit Court of Appeals decision; is this right?

Objected to on the same grounds as to the last question.

A. I don't recall having so stated.

X Q. 61. Answer the question, please?

A. I can't answer that question the way you have got it.

X Q. 62. Is this license, or form of license, printed in this Circuit Court of Appeals — between pages 49 and 65, what you now term the proposed license gotten up and printed by the complainants in this case after the Court of Appeals decision?

Objected to same as before.

A. I couldn't tell that without comparing them.

X Q. 63. Haven't you those licenses in your possession?

Objected to as wholly incompetent, immaterial and irrelevant and the attention of the Court is respectfully called to the fact that this is lumbering up the record with wholly useless and immaterial matter, and the further fact that counsel for defendant continually refers in his question to "this license" which he holds in his hand which is not a license, but is at most but an unexecuted form of what might, or what might not have been a license, depending on the action of the proposed parties thereto.

A. I have forms of licences.

X Q. 64. Will you bring one of those forms of licenses drawn and printed after the decision of the Court of Appeals of this Circuit with you to your examination to-morrow morning?

Objected to as incompetent and immaterial and irrelevant, because, first, if they are only proposed licenses they would certainly be incompetent, irrelevant and immaterial, and if they were actually signed licenses they would still be unimportant in this inquiry, and the witness is advised that he is not obliged to bring with him any proposed licenses or actual licenses which may be in his possession or custody as an officer of complainant company unless it should be a license with the defendant in this case.

A. Under advice of counsel, I decline to do so.

X Q. 65. Your attention is called to the fact that you have not been advised in this last objection not to do so and you have stated in answer to a former question that personally you have no objection to so doing. Nor will you produce this form of license at the next meeting?

Counsel for complainants objects to the question on the ground that it is irrelevant and immaterial, and believing that any proposed licenses are fully irrelevant to this inquiry he advises the witness not to produce any proposed licenses, if any exist, and further that the request and question is too indefinite, and the attention of the Court is called to the fact that it does not call for any particular license or form of proposed license.

A. Under advice of counsel I decline to do so.

X Q. 66. Look and read carefully this license appearing upon printed pages 49 and 65 of the U. S. Circuit Court of Appeals record and state if you can see any difference whatever between that license as there printed and the form of license which the complainants in this case printed after the decision of the U. S. Circuit Court of Appeals for the Second Circuit?

Counsel for complainants objects to the question on the ground that it is not proper cross-examination, is not within the issues, is immaterial and irrelevant and is too indefinite, and advises the witness that he is not compelled to read sixteen pages of defendant's printed record on appeal in order to answer the question, and advises him not to attempt to do so.

A. Under advice of counsel I decline to do so.

Adjourned to 11:30 A. M. on Friday, July 26th, 1907.

NEW YORK, *July 26th*, 1907.

Met pursuant to agreement at the office of Charles W. Stapleton, 220 Broadway, New York, at 11:30 A. M.

Present: Counsel as before, Charles W. Stapleton, Esq., for Complainants; Charles K. Offield, Esq., for Defendant.

Counsel for complainants states that the witness Seaman is compelled to be absent from this session or at least at this time, and therefore, asks that counsel for defendant *to* consent that we proceed with other witnesses who are present.

Counsel for defendant consents to the above.

Thereupon AUGUST BEHRING, a witness produced on behalf of the complainants, being first duly sworn, testified as follows in answer to questions put by Mr. Stapleton:

Q. 1. State your name, age, occupation and place of residence?

A. August Behring; age, 48; occupation, blacksmith; place of residence, 420 East 148th Street, New York City.

Q. 2. By whom are you at present employed?

A. At present by the Diamond Rubber Company of New York.

Q. 3. Do you know when the Diamond Rubber Company of New York was organized?

A. I don't know that but I have worked there two years come the end of this month.

Q. 4. What has been your work for the defendant?

A. I do blacksmith work there, all blacksmithing. Iron work.

Q. 5. Applying steel channels to wheel-?

A. Yes.

Q. 6. Do you also help apply the rubber tires?

A. No, sir, I have nothing to do with that, I have nothing to do but with the iron work.

Q. 7. Do you know whether or not the defendant applies rubber tires at its place of business in New York where you work?

A. No, I don't know that.

Q. 8. For what purpose do you put on the steel channels?
A. Well, I get the orders and then I put them on.
Q. 9. What do you do with the wheels then?
A. I leave them stay there.
Q. 10. Do they stay there forever?
A. No, sir.
Q. 11. What becomes of them?
A. Well, what should I say, shall I say what I said to you or Mr. Adams?

Counsel for complainants asks that it be noticed that the witness asks this question of counsel for defendant.

Counsel for defendant states that the witness is instructed to state the facts, all the facts, as he knows them.

Q. 12. Have you been talking to Mr. Offield or Mr. Adams this morning?
A. With this gentleman—yes, I just came from Mr. Offield's office this morning.
Q. 13. In company with whom?
A. With this gentleman here, Mr. Ingham, counsel for the Diamond Rubber Company.
Q. 14. I show you Complainants' Exhibit, Defendant's Tire, have you ever seen any rubber tires of this kind before?
A. Yes, plenty of them.
Q. 15. Ever see any of them in the place of business of the defendant up where you work?
A. Yes, sir.
Q. 16. How many like this?
A. They come in round reels of a hundred feet long and so on.
Q. 17. Then what is done with those reels of rubber?
A. Some they put on wheels and some they sell outside.
Q. 18. Of these which they put on wheels in the place of business where you work, is the rubber put in the steel channel which you put on the wheels?
A. Yes.
Q. 19. Have you seen it being done?
A. Yes, sir.
Q. 20. Many times?
A. Yes, sir, every day.
Q. 21. Since how long?
A. Since I am working there.
Q. 22. On new or old wheels?
A. New wheels and old wheels.
Q. 23. On perhaps a hundred or more wheels have you seen it, I mean including all times.
A. Yes, at least a hundred.
Q. 24. Do these tires that you refer to contain two retaining wires like the exhibit shown you?
A. Yes, like that. Not all, there is different kinds, different patterns.
Q. 25. I only call your attention to those which you have seen put on which are like this exhibit, the wheel before you?

A. Yes, they had some of that kind too.

Q. 26. Then, I understand, Mr. Behring, that during your employment for the defendant you have been at their place of business here in New York, seen a large number or a considerable number of rubber tires applied which are like the exhibit now shown you?

A. Yes.

Q. 27. In all respects, so far as you now know, they were just like this tire, were they, except that this is cut out and mutilated?

A. Yes.

Q. 28. That is, there was a steel channel applied to a wooden wheel rim, and in the steel channel is adjusted a rubber section, which rubber section carries two retaining wires encircling the entire wheel holding the rubber section which completely circles the wheel in the steel channel, making a complete tire or wheel rim ready for service; is that right?

A. Yes, that's right. When it's on it's ready for use.

Q. 29. And you refer to tires just like the exhibit shown you; do you not?

A. Yes.

Q. 30. Do you know what became of these wheels after they were equipped with rubber tires?

A. They go back to customers where they come from.

Defendant's counsel objects to this entire deposition as incompetent, irrelevant and immaterial, and cross-examines subject to that objection.

Cross-examination by Mr. OFFIELD:

X Q. 31. Does the corporation, the Goodrich Rubber Company, make any of the steel channels that you put on the wheels at the Diamond Rubber Company's place of business?

A. Do you mean do they make the channels themselves—no. They don't make them, as much as I know.

X Q. 32. Where does the Diamond Rubber Company get their steel channels that you put on, if you know; any of them?

A. They buy some in the Goodrich Company and they buy them sometimes in Sherwood's.

X Q. 33. Do you know whether the Diamond Rubber Company puts on steel rims or tires for any person except such a person is licensed and has a right to use such tires and rims from the Consolidated Rubber Tire Company?

A. I don't know that, I got nothing to do with that; that belongs to the boss, that's outside.

X Q. 34. When an owner of a cab or other wagon or vehicle comes into the Diamond Rubber Company's place of business, to have a tire put on, they usually have the steel channel on the wheel and the old rubber tire is taken off the wheel and a new tire put on; is it not?

A. Sometimes it is a reset job and sometimes it is a new tire.

X Q. 35. A new tire that is to take the place of a worn out tire?

A. Yes.

X Q. 36. And sometimes on new wheels?
A. I don't know what you mean by that, I don't understand you.

Redirect-examination by Mr. STAPLETON:

R. D. Q. 37. Is it not true, Mr. Behring, that sometimes new wheels come to this place where you work, on which new tires are applied like the tire in the exhibit shown you?
A. I've got to think of that, there are so many jobs all the time—it is only old wheels, not new wheels, except automobile wheels.
R. D. Q. 38. You stated on your direct-examination that tires, like the one on the wheel before you, had frequently been applied to new wheels in this place where you work. Do I understand now that you wish to change that, that they never had been applied to new wheels, or have they sometimes been put on to new wheels?
A. About a year and a half ago we had export wheels, 7/8ths, they were new wheels.
R. D. Q. 39. With this kind of tire, like this on the wheel before you?
A. Half had cushions, and half had the two wire tire, like the tire on the exhibit before me.
R. D. Q. 40. I suppose there may have been other cases where tires were applied to new wheels, although you do not remember?
A. No, not as much as I remember.
R. D. Q. 41. These tires which you have been speaking of, meaning the tire like that on the exhibit before you, were applied before June 12th of this year, were they not?
A. You mean them kind of tires? Yes.

Deposition Closed.

Thereupon Mr. THOMAS APPLETON, a witness produced on behalf of the complainants, being first duly sworn, deposes and testifies as follows, in answer to questions by Mr. Stapleton:

Q. 1. Please state your name, age, residence and occupation?
A. Thomas Appleton; age, 43; residence, 105 Ryerson Street, Brooklyn, N. Y.; occupation, blacksmith.
Q. 2. You may state whether or not you have been in the employ of the defendant, the Diamond Rubber Company of New York, and, if so, for what time and in what capacity?
A. Yes. I was in their employ from July in 1905 to March of 1906, as salesman.
Q. 3. During this time were you frequently at defendant's place of business in New York?
A. Every day.
Q. 4. And were you in the blacksmith shop and room where the defendant applied its rubber tires at numerous times?

Defendant's counsel objects to the deposition of this witness as incompetent, irrelevant and immaterial, and for the further reason that this case is now pending in the United States Circuit Court of Appeals for the Second Circuit, and the entire record for final de-

cision, and admittedly will be taken to the Supreme Court of the United States upon petition for writ of certiorari for its removal if such petition is granted, and for the further reason that the taking of this testimony is incompetent by reason of the fact that the name of this witness has not been furnished defendant, nor had defendant any notice of the taking of the testimony of this witness except a general and indefinite notice without identification or reference to witness who is to be examined.

A. Yes.

Q. 5. And did you on these occasions see the workmen engaged in applying rubber tires to new and old wheels?

A. No.

Q. 6. What were the workmen doing when you saw them?

A. They appeared to be preparing tires for application.

Q. 7. What do you mean by preparing?

A. Why, measuring the wheel, the circumference of the wheel, and laying the tires, or the rubber, on the bench, and putting in the wires.

Q. 8. Were those sections of rubber and the wires and steel channel which you saw in course of preparation in all respects like the rubber steel wire on the wheel which I now show you, being Complainants' Exhibit Defendant's Rubber Tire, except as regards size?

A. Yes.

Q. 9. Did you subsequently see tires of the kind like this on the wheel exhibit before you either in the defendant's warerooms or being sent out to customers?

A. I saw them in the warerooms.

Q. 10. On both new and old wheels?

A. I couldn't say as to new wheels, but positively I have seen them on old wheels.

Q. 11. Can you recall the names of the customers to whom the defendants supplied tires like the exhibit, Defendant's Tire, prior to June 12th, 1907?

A. No.

Q. 12. Were you familiar with the class of business done at defendant's place of business in New York while you were in its employ?

A. Yes.

Q. 13. Did they not advertise and hold out to the trade and the public generally that they would furnish or supply solid rubber tires?

Objected to as incompetent, irrelevant and immaterial and hearsay and not the best evidence.

A. Yes.

Q. 14. And solid rubber tires of the same kind as this now upon the wheel before you, being Exhibit Defendant's Rubber Tire?

A. Not during the time that I was in their employ.

Q. 15. Have they done that since to your knowledge, and before June 12th, 1907?

Objected to as last stated.

A. I can't say, I haven't followed the rubber tire question.

Q. 16. The defendant did, however, while you were with it, apply these tires to wheels for such customers as called for them?

Objected to for the reason that the witness has already stated that he has no personal knowledge as to this matter, except as stated by him.

A. Yes.

Defendant's counsel again objects to the testimony of this witness as incompetent, irrelevant and immaterial and moves to strike the same from the trial or record of this case and declines to cross-examine him.

Deposition closed.

Recess until 2 P. M.

After Recess, 2:15 P. M.

Cross-examination of FREDERICK A. SEAMAN resumed by Mr. OFFIELD:

X Q. 67. Has the complainant the Rubber Tire Wheel Company any property or assets of any kind, name, nature or description except the interest named by that company in the letters patent in suit?

A. Yes.

X Q. 68. What?

A. It has other patents.

X Q. 69. Any other kind or species of property whatever except letters patent?

A. I don't know that I can answer that question off-hand. It has contracts, and it also has licenses.

X Q. 70. Any other species of property except licenses under its patent or contracts?

A. I don't think it has, but I wouldn't like to say positively no.

X Q. 71. So far as you know these licenses or contracts and patents constitute the entire assets of the Rubber Tire Wheel Company, defendant?

A. That's correct, subject as I say to further thought.

X Q. 72. Does the Rubber Tire Wheel Company pay any salaries to any of its officers, to your knowledge?

A. No, it's not paying any salaries now except Directors' fees for meetings.

X Q. 73. Do you mean under the Ohio State Statutes?

A. I am not familiar with the Ohio State Statutes and I don't know what that means.

X Q. 74. Well, what Directors' fees did you mean that the Rubber Tire Wheel Company paid?

A. I mean what I said, attendance of Directors at meetings, the fees.

X Q. 75. How much?

Objected to as immaterial.

A. I think it is either Five or Ten dollars per meeting.

X Q. 76. Has the Rubber Tire Wheel Company, defendant, ever had a Directors' meeting to your knowledge, and if so, when?

A. They have had a great many Directors' meetings; I can't think of the exact dates. There was one I think—there were three meetings this year, to the best of my recollection.

X Q. 77. Have you changed your mind about showing to the Court or putting in this record in answer to interrogatories that I asked you yesterday to the proposed license drawn by the complainants under the patent in suit since the decision in the Circuit Court of Appeals in this Circuit?

A. No.

X Q. 78. You are entirely familiar, are you not, with the affairs of the Rubber Tire Wheel Company?

A. Yes.

X Q. 79. Have you charge of the records and documents of that company?

A. Yes.

X Q. 80. Where are they?

A. In my possession.

X Q. 81. Where?

A. In New York.

X Q. 82. And there are none of the records or documents of the Rubber Tire Wheel Company at its office at Springfield, Ohio, are there?

A. I don't think there are unless some of our attorneys there may have some in their possession; I don't believe there are though.

X Q. 83. Did the Rubber Tire Wheel Company ever actually manufacture rubber tires or wheels of any description?

A. I was not connected with the Rubber Tire Wheel Company prior to July, 1899, at which time I have testified the Consolidated Rubber Tire Company took over the active business, but my information is that prior to that time the Rubber Tire Wheel Company manufactured rubber tires applying them to wheels, but whether or not they ever made wheels or not, I don't know.

X Q. 84. But since the year 1899 the Rubber Tire Wheel Company, to your knowledge, has never manufactured, used or sold in any way either wheels, rims or rubber tires; has it?

A. Except through licenses.

X Q. 85. Do you mean by this do you not that the Rubber Tire Wheel Company granted licenses under the patent in suit and collected royalty under the license; is that it?

A. Yes, I think that's about it, except that the business as I have previously testified was taken over and managed for the Rubber Tire Wheel Company by the Consolidated Rubber Tire Company.

X Q. 86. What do you mean by this last statement? Do you mean that since the year 1899 the Rubber Tire Wheel Company has had any interest in or connection with the business or profits of the Consolidated Rubber Tire Company?

A. No, I don't think it had any interest.

X Q. 87. You have stated that the Rubber Tire Wheel Company

neither manufactures, uses nor sells rubber tires since the year 1899. Now, has the co-complainant, the Consolidated Rubber Tire Company any other business except the manufacture and sale of rubber tires under the patent in suit?

A. Oh, yes, it has other interests.

X Q. 88. Has it any other business except that?

A. Yes.

X Q. 89. Well, isn't it true that substantially the entire business of the Consolidated Rubber Tire Company is the manufacture and sale of rubber tires under the patent in suit, or like the patent in suit?

A. Decidedly, that is the bulk of its business, it manufactures and sells machines and it sells machinery, and other rubber articles.

X Q. 90. Yes, but is it not true that substantially the entire business of the Consolidated Rubber Tire Company is the manufacture and sale of rubber tires under the letters patent in suit?

A. I don't think I am prepared to admit that without taking into *extent* the entire business. It is immaterial, only I am trying to get at the truth.

X Q. 91. Well, isn't it true then that the Consolidated Rubber Tire Company, the complainant, was organized for the especial purpose of manufacturing solid rubber tires under or like that of the patent in suit?

A. It has been sometime since I have read the certificate of incorporation of the company, but my recollection is that the charter gives it a very broad scope to deal in all kinds of material, compounded from rubber and its allied industries.

X Q. 92. On the 11th day of July, 1907, before Adele V. Juillerat, Notary Public, New York County, you made the following statement under oath, namely: "That substantially the entire business of the Consolidated Company is the manufacture and sale of rubber tires, covered by the patent in suit, and that it was organized for that purpose." Is your recollection any better now than it was two weeks ago, or any different?

Question objected to on the ground that it is misleading; that the extract from the affidavit quoted is not in any way inconsistent with what the witness has just testified to, and the implication in the question that it is so inconsistent is unwarranted and unjustified.

A. No.

X Q. 93. You wish your statement to stand on the record as it now does, without any explanation?

A. I am satisfied.

X Q. 94. Have you intended to state that the Consolidated Rubber Tire Company was a licensee of the Rubber Tire Wheel Company under the patent in suit?

A. Yes, that's right.

X Q. 95. Is there any written license from the Rubber Tire Wheel Company to the Consolidated Rubber Tire Company under the patent in suit?

A. No.

X Q. 96. Has the Consolidated Rubber Tire Company ever paid the Rubber Tire Wheel Company any money for any interest in the patent in suit?

A. I am not sure that I can answer that of my own knowledge, but I don't think it ever did. I was not connected with the Consolidated Rubber Tire Company when it was organized.

X Q. 97. Did the Rubber Tire Wheel Company ever pay a dollar, to your knowledge, or any other consideration for the Grant Patent in suit?

A. I have always understood that it did, but I was not connected with the Rubber Tire Wheel Company in the early days.

X Q. 98. And you have no personal knowledge on this point?

A. No personal knowledge, no.

X Q. 99. You testified in an affidavit made in this case, sworn to upon the 11th day of this month, July 11th, 1907, as identified by a former question, that the Consolidated Rubber Tire Company and its predecessors paid for the patent in suit upwards of $1,000,000 in cash, besides other valuable considerations, did you not?

A. I think that I did, to the best of my recollection, I haven't the affidavit before me, but I think so.

X Q. 100. Can you explain to the Court how you swore to that statement as a fact in that affidavit when you now say you don't know anything about it and have no personal knowledge upon the subject?

A. My affidavit covered a broad statement. You ask me a particular question and I told you to the best of my belief, but to my actual personal knowledge, I didn't know, but to my belief I did.

X Q. 101. The affidavit doesn't say anything about the best of your belief, for what you believe is no matter of moment, but you made your oath in that affidavit to this statement as a fact. Have you any explanation to make between the statement of your oath in that affidavit and your statement now made on the record as to belief?

Mr. STAPLETON: I object to counsel's lecturing the witness and putting argument into his question, especially when his argument misstates facts and misconstrues the affidavit and the evidence. The attention of the Court is called to the fact that there is no inconsistency between the statements of the witness and the subject now inquired about is not within the issues, is not a proper subject of cross-examination, is irrelevant and immaterial.

Defendant's counsel calls the attention of the Court to the fact that he is in the utmost fairness to this witness in giving him an opportunity to explain two diametrically opposite statements made under his oath.

A. I have no explanation to make because I think my answers are consistent.

X Q. 102. Do you know anything about the purchase of this Grant Patent in suit, as alleged, by the Rubber Tire Wheel Company?

A. I don't think I have personal knowledge.

X Q. 103. When was the first you ever heard of this Grant Patent in suit, as to the year?

A. In 1899.

X Q. 104. Then, personally, you don't know anything about whether or not when the Rubber Tire Wheel Company alleged to have purchased the Grant Patent that that company bought that patent in good faith or believed it to be valid?

Complainants' counsel hands the witness the affidavit in question and instructed him to read it.

Defendant's counsel objects to this manner of instructing the witness how to answer the question, and in posting him as to the contents of an affidavit made not more than two weeks ago in relation to which he is being interrogated and in relation to which evidence the witness has forgotten what he has testified to in his affidavit, and now being sworn and interrogated as to the actual facts.

A. I have always understood that it was bought by the Rubber Tire Wheel Company in absolute good faith as to its validity when you ask me if I know that from my own personal knowledge as having been connected with the Rubber Tire Wheel Company at that time I say no, but I do believe that I am correct in stating that I know that to be a fact from the records of the company and from what I have learned of its history.

X Q. 105. Then your testimony in your affidavit upon this subject is based upon what somebody else told you and from some conclusion you may have drawn from some records in your possession; is that it?

A. Yes, and which I believe to be true.

X Q. 106. Do you know who purchased the Grant Patent for the Rubber Tire Wheel Company who actually made the trade? I am asking you for your own knowledge.

A. I have always understood that Mr. Kelly did.

X Q. 107. But that was simply hearsay?

A. It is hearsay many times confirmed?

X Q. 108. Has the Consolidated Rubber Tire Company any licensees under this Grant Patent in distinction from the Rubber Tire Wheel Company and separate from that company?

A. Having reference to my answer in which I endeavored to instruct you between the difference between a shop right and a license I don't think that the Consolidated Company has any separate licenses under the patent in suit. However, there may be some isolated cases, I don't remember.

X Q. 109. Has the Rubber Tire Wheel Company since 1899 itself granted any licenses under the patent in suit without joining the Consolidated Rubber Tire Company therein?

A. I think it has.

X Q. 110. In an Affidavit made in this case and above identified, you stated as follows: "That said Consolidated Company has numerous licenses from whom it receives a consideration in the nature of a royalty for operating under such patent;" did you not?

A. I did, yes.

X Q. 111. Did you mean by Consolidated Company in that answer the complainant in this case, the Consolidated Rubber Tire Company?

A. Yes.

X Q. 112. And did you mean that that company alone had numerous licensees from whom it received a consideration in the nature of a royalty, and so forth?

A. I had in mind shop rights particularly when I made that affidavit, and I also had in mind the licenses in which both complainants had joined in issuing.

X Q. 113. As I understand you, the Consolidated Rubber Tire Company alone grants shop rights under the patent in suit; is this right?

A. Yes, that's been the business procedure of late.

X Q. 114. When did the Consolidated Rubber Tire Company or the Rubber Tire Wheel Company grant its last license or shop right?

Mr. STAPLETON: I object to the question as not the proper subject for cross-examination, not within the issues in this suit, being too remote, also as incompetent, irrelevant and immaterial, and counsel for complainants now advises counsel for defendant that, in his judgment, this inquiry concerning immaterial matters has proceeded far enough, and that he deems it his duty to advise the witness that this is a question concerning private business in no way connected with the suit and he is not called upon to answer; and in order that this collateral and immaterial inquiry may come to an end sometime advises him to decline to answer the question.

A. Under advice of counsel I decline to answer.

X Q. 115. Have you any objection personally as an officer of either corporation to answer the question?

A. I have.

X Q. 116. What's the objection?

A. There are two objection among others that I might mention. One is that you appear to be asking a lot of questions inquiring into our private affairs and the other is counsel advises me it isn't necessary to answer such questions.

X Q. 118. You seemed to be willing enough to state your so-called private affairs when your intention is to injure a competitor in business, as shown by your affidavit, but do you now refuse to state or disclose to the Court the shop right and the licenses that you intended to identify by this affidavit and in relation to which you swear that the Consolidated Company has numerous of these licenses and is receiving a consideration in the nature of a royalty?

Counsel for complainants calls the attention of the Court to the argument injected into the question, and the statement of defendant's counsel, and objects to the question as being ridiculous and without foundation, improper and irrelevant.

A. I will produce anything that the Court orders me to produce.

X Q. 119. Will you produce at the next session one of these licenses and one of these shop rights that you referred to in your affi-

davit, filed in this case, so that it can be made a part of this record and that you can be intelligently interrogated in relation thereto?

Objected to as not proper cross-examination, not within the issues in this suit, irrelevant and immaterial, and advises the witness that he is not called upon to produce any such papers in this suit merely at the request of counsel for defendant, and particularly as that would be a disclosure of the private affairs of the complainants which are in no way involved in this suit. Counsel for complainants again calls the attention of the Court to the prolix spinning out of this cross-examination on wholly irrelevant and immaterial matters.

A. I will not unless so ordered by the Court, for the reasons already stated.

Defendant's counsel states upon the record that complainant's examining counsel has given notice that he will read the affidavit of this witness in relation to which he is being interrogated to the Court upon a hearing proposed to be had in this case August 7, 1907, and as defendant's counsel if he has abandoned this affidavit in relation to which he instructs his witness at the same subject-matter not to reply and has withdrawn it.

Counsel for complainants states in reply that he has neither time nor disposition to answer absurd questions and declines to do so at this time to any further extent.

X Q. 121. When did you first know personally of any litigation of any kind or description over this patent in suit?

A. When I became an officer of the Consolidated Rubber Tire Company in 1899.

X Q. 122. And you know personally nothing about any litigation in relation to this suit prior to 1899?

A. I know from the records of the company and the history of the company that there was litigation prior to 1899, and I should think it would come within the scope of an honest answer that that is practically personal knowledge.

X Q. 123. Is the Goodyear Tire & Rubber Company a licensee under the patent in suit of the Consolidated Rubber Tire Company or of the Rubber Tire Wheel Company, or either of them?

A. Not now.

X Q. 124. Is the Kokomo Rubber Company a licensee from either or both of the corporations concerned in this case under the patent in suit?

A. Not now.

X Q. 125. Is the Victor Rubber Company a licensee of either of the complainant corporations under the patent in suit?

A. Not now.

X Q. 126. Is the Hartford Rubber Works Company a licensee under either of the patents in suit?

A. Not now.

X Q. 127. You stated in this affidavit you made in this case that all of these companies, among others, had paid license fees to the Consolidated Rubber Tire Company; did you not?

A. Yes.

X Q. 128. Who were the others that you referred to in this affidavit as having paid license fees under the Grant Patent in suit?

A. The B. F. Goodrich Company, Morgan & Wright, the International Rubber Company, the Diamond Rubber Company, the defendant in this suit, or rather I should say perhaps, the company which I understand controls or owns the defendant in this suit, the Sweet Tire & Rubber Company, and there may have been others but I don't just at the moment recall.

X Q. 129. Do any of these parties named in your last answer now hold a license or pay a royalty to either the Consolidated Rubber Tire Company or the Rubber Tire Wheel Company under any of these licenses of the Grant Patent in suit?

A. No.

X Q. 130. Then neither of the corporation complainants in this case have any outstanding and admitted licenses at the present time under the patent in suit; is this correct?

A. No, it is not correct.

X Q. 131. Where is the error?

A. I have already testified that we have numerous shop rights all over the country.

X Q. 132. I am not asking you about as indefinite a thing as a shop right. But I am asking you concerning the licenses which either of these corporations complainants, either jointly or severally, have ever granted, since the year 1899, or before that—are any of those licenses now existing or any party paying royalty under the Grant Patent only?

A. I should say that we are receiving royalties from a great many parties in the United States and under these shop rights that I have spoken of.

X Q. 133. But none under any licenses?

A. Well, that's a question of distinction that I don't feel qualified to determine.

X Q. 134. Will you, at the next session, bring one of these shop rights here, so that the Court can see what it is?

Complainants' counsel makes the same statement and raises the same objection as made and raised to X Q. 119, and makes this reference to save a detailed statement, and advises the witness to the same effect.

A. Under advice of counsel, I decline to do so.

X Q. 135. The parties you have mentioned not only in this affidavit but in answer to interrogatories, to have paid license fees to the complainants under the patent in suit, are all manufacturers of rubber tires, are they not?

A. I believe so.

X Q. 136. Well, has the complainants, or either of them now, any existing license with any rubber tire manufacturing company under which royalties are paid under this Grant Patent?

Objected to as immaterial, irrelevant, not within the issues, not proper cross-examination.

A. No.

X Q. 137. What is the business of these parties that you say you have granted shop rights to, or the complainant, the Consolidated Rubber Tire Company has granted shop rights under the patent in suit? What kind of a business do they do that enables them to use the tire of the Grant Patent?

A. They are manufacturers of carriages, dealers, jobbers of carriages and the like.

X Q. 138. Is this shop right a paid up right for each shop?

A. What do you mean by a paid up right?

X Q. 139. I mean do they buy the right of the complainants, or either of them?

A. Just at present I can only recall one instance where parties of the character I have just outlined actually paid for a shop right now in existence, and they continue to purchase tires from us.

X Q. 140. Well, are any of the shop rights that the complainants have granted, or either of them, in existence?

A. Yes, I have just so testified.

X Q. 141. You have refused to bring one of these shop rights here. Do you refuse to bring any of the licenses that you say the complainants, or either of them, have granted to the rubber tire manufacturers of this country, which you have described, so that you may have it present at your next examination?

Complainants' counsel repeats the objections made and advice given to X Q. 119.

A. Under advice of counsel, I decline to produce.

Complainants' counsel says he will not be here to-morrow morning, Saturday, July 27th, 1907, and takes an adjournment to Monday, July 29th, 1907, 11:30 A. M.

NEW YORK, *July 29th*, 1907.

Met pursuant to adjournment at the office of Charles W. Stapleton, 220 Broadway, New York City.

Present: Counsel as before, Charles W. Stapleton, Esq., for Complainants; Charles K. Offield, Esq., for Defendant.

Cross-examination of FREDERICK A. SEAMAN resumed by Mr. OFFIELD:

X Q. 142. When was the last suit brought against any party for an infringement of this Grant Patent in suit; do you know?

A. I can't give you the exact date nor which one was brought last, but I think that the last suit was against the Diamond Rubber Company of New York.

X Q. 143. No suit has been brought against the Diamond Rubber Company, an Ohio corporation, under the Grant Patent, who manufacture and sell rubber tires; has there?

A. Not that I am aware of, and I can't say for certain whether or not a suit was brought against the Diamond Rubber Company of Ohio several years ago.

X Q. 144. Calling your attention again to this license papers with the printed names of both complainants, the names thereof appearing

upon pages from 49 to 65 of the printed record in this case now pending in the United States Circuit Court of Appeals for this circuit, you know, do you not, that in the month of May or June just passed, the complainants in this case sent a printed copy of this license to the Diamond Rubber Company of Ohio, at Akron, Ohio, and demanded that they accept and execute the same immediately or they would be sued for infringement of the Grant Patent in suit within ten days?

Objected to as irrelevant and immaterial and that if any such request was made, or demand or threat made, it must have been in writing, and the writing is the best evidence. The question should be divided so that the witness can answer it specifically.

A. I do not know it.

X Q. 145. Don't you have the same kind of knowledge of this fact you have of the facts set forth in your affidavit referred to?

Objected to as immaterial and irrelevant.

A. I can't say whether that is a copy of any license which we may have sent out to anyone or not.

X Q. 146. You know, do you not, that the complainants in this case, or their counsel, are continually now threatening to sue the Diamond Rubber Company, the Ohio corporation, or their customers who purchase solid rubber tires of them, for infringement of this patent in suit?

COMPLAINANT'S COUNSEL: We will concede that if you wish it.

A. Yes.

X Q. 147. Do you know that these threats to begin these suits, as indicated in the former question, have been made as to suits to be brought in the Sixth Federal Circuit, namely, the States of Michigan, Ohio, Tennessee and Kentucky?

Counsel for complainants concedes that complainant companies have given their attorney directions to prosecute infringers of the patent in suit including the Diamond Rubber Company of Ohio, and that the attorneys are busy bringing suits as fast as they can conveniently and in prosecuting them whenever and wherever they think it is most advisable and most expedient, and proof of the infringement is most accessible, and counsel for complainants further objects to the characterization of the question as threats.

A. As far as I know the instructions have been given to our attorneys to bring suits anywhere in so far as they deem expedient.

X Q. 148. What do you mean by the use of the term expedient in this answer?

A. Best or easiest or most convenient.

X Q. 149. Best or easiest or most convenient to whom?

A. Why, to complainants, of course.

X Q. 150. Do you know Mr. Van H. Cartmell who has made an affidavit in this case on the same day as yourself, namely July 11th, 1907?

A. I know Mr. Van H. Cartmell.

X Q. 151. Is he the President of the Consolidated Rubber Tire Company?

A. Yes, he is.

X Q. 152. Where does he live?

A. New York City.

X Q. 153. How long has he been President of that company?

A. I think since sometime in 1901 or 1902.

X Q. 154. Did he have anything to do with either of these corporation complainants before that time?

A. Yes.

X Q. 155. Has he any other business?

A. No. He has other interests, but he devotes his time practically entirely to the interests of the complainant.

X Q. 156. Since the decision of the U. S. Circuit Court of Appeals against the Firestone Company, has that company taken any license of any kind under the patent in suit?

Objected to as not relevant to the issues, not proper cross-examination, and wholly immaterial.

A. No.

X Q. 157. Since the decision in the United States Circuit Court of Appeal- has the Firestone Company paid any of the taxable Court costs in that case or in the case in the Court below?

A. I don't know.

X Q. 158. Since the decision in the United States Circuit Court of Appeals for the Second Circuit against this Firestone Company, has that company paid a dollar in money either as profits or damages for a settlement of that case?

Objected to on the same grounds as those raised to X Q. 156.

A. Not to my knowledge.

X Q. 159. Since the decision in the United States Circuit Court of Appeals for this Circuit against the Firestone Company, has the complainants or one of them purchased from the Firestone Company a patent issued to one George A. Ludington, under date of March 8th, 1904, and numbered 754,078, and which is identified in the printed license of the complainants, or form of license upon page 62 of the printed record of this case in the United States Circuit Court of Appeals for the Second Circuit?

Same objection as raised to X Q. 156.

A. The Ludington Patent was purchased from the Firestone Company, but I don't know anything about copy of an alleged license which you refer to as being in the printed record.

X Q. 160. How much did the complainants, or either of them, pay for this Ludington Patent?

Objected to as incompetent, irrelevant and immaterial, not proper cross-examination, not within the issues and as a bald and naked attempt on the part of defendant to pry into complainant's business, and the witness is advised that he is not called upon to answer the question and advises him not to name any price paid on the ground that it is purely private business.

A. On the advice of counsel I decline to name the price paid.

X Q. 161. It was a great many Thousand dollars, was it not?

Same objection made and the same advice given as before.

A. Under the advice of counsel I decline to answer.

Defendant's counsel here gives notice that before the hearing of this case he will ask a ruling from the Court as to the competency and relevancy of the questions asked, and an order from the Court to compel the witness to be produced by complainants' counsel for further cross-examination and to answer fully and freely without further evasion or concealment as to all the facts inquired of as to subject-matter concerning which this witness refused to answer and in view of the repeated refusals of the witness to answer questions, defendant's counsel declines to further cross-examine the witness, and objects to the witness signing this deposition until the matters identified by these objections and refusals to answer are passed upon by the Court.

Counsel for complainants advises counsel for defendant that he will go with him forthwith, without notice, before the Court with the official copy of the minutes on such an application, and invites counsel for defendant to proceed with him at once for that purpose.

Defendant's counsel replies that he understands complainants' counsel proposes to make some kind of an argument or presentation before his Honor, Judge Holt, upon the 7th of August, prox., and that Judge Holt, now having this case before him, upon repeated argument and motion, can alone in the opinion of defendant's counsel, pass upon these questions from the fact that any other Court would be compelled to make a study of the record so far to rule upon these questions and from the fact that Judge Holt is under the rule of course disqualified from sitting in the Court of Appeals for the Second Circuit upon a hearing of this case, and any other Judge who would take up these questions would of course be disqualified.

Counsel for complainants further offers to now suspend the further examination of the witness and these proceedings so that the official record may go at once before any Judge of the Circuit Court for this circuit, of which there are presumably several in attendance at the Federal Building in this City at this moment and to accompany counsel for defendant with the official record before any such Judge at Chambers or otherwise for the speedy determination of the question.

Redirect Examination by Mr. STAPLETON:

R. D. Q. 162. In an affidavit about which you have been cross-examined, made in this case, and verified July 11th, 1907, you state that the Consolidated Company and its predecessors paid for the patent herein upwards of $1,000,000 in cash. Did you intend to qualify that in any way on your cross-examination or is the said statement the fact, and is it correct?

Objected to because the witness has shown by his testimony that he has not the slightest personal knowledge on this point.

A. I believe it to be correct.

R. D. Q. 163. You were asked at X Q. 158 if the Firestone Company since the decision against it had paid anything as profits or damages in settlement of that case. In view of that I will now ask you whether or not negotiations are now pending by which the Firestone Company is to pay a license fee on its future product of tires made under the patent in suit?

A. Yes.

R. D. Q. 164. You were also asked at X Q. 157 if the Firestone Company had paid the costs of that suit, and you replied that you did not know. Has either of the complainants paid any of the costs, I mean the taxable costs, against defendant in that suit?

A. I am not sure that I know what you mean.

R. D. Q. 165. I refer to defendant's costs and not such costs as the Consolidated Company has had to pay on its own account to the Court officers and attorneys during the progress of the suit?

A. I don't know of any such payment.

R. D. Q. 166. Would you know if there had been any payment?

A. I certainly think I would.

R. D. Q. 167. You said on cross-examination you thought the Ludington Patent was bought from the Firestone Company. I desire now to ask you if, upon reflection, you are still of that opinion, or did the title to the Ludington Patent come from the Continuous Length Tire Association?

A. I believe the title did come directly from the Continuous Length Tire Association.

R. D. Q. 168. You have been further asked on cross-examination if the complainants granted licenses subsequent to the decision against the patent in the Circuit Court of Appeals in Ohio, to which you replied in the affirmative. Please state now why you did grant licenses and exact royalties, notwithstanding that decision?

A. Because we were advised that our patent was valid and that we had a right to execute licenses and receive royalties, notwithstanding the decision.

R. D. Q. 169. Who gave the complainant company such advice?

A. There were numerous patent counsel who told us that the patent was perfectly good. I recollect that Mr. Charles K. Offield made that statement to me personally in the presence of Mr. Van H. Cartmell after that decision.

R. D. Q. 170. You mean, I suppose, Mr. Offield, counsel for defendant in this case, do you not?

A. Yes.

R. D. Q. 171. Where and when, if you remember, did Mr. Charles K. Offield advise you that the patent was good, notwithstanding the decision in the Ohio Court of Appeals.

A. In the office of the Consolidated Rubber Tire Company in New York City, sometime after that decision in the Sixth Circuit.

R. D. Q. 172. You may state whether or not at the time this advice to which you refer was given by Mr. Offield, Mr. Offield's firm, that is, the firm of Offield, Towle & Linthicum were in the employ of either of the complainants or whether they were in the employ of

complainants either previous or subsequent to the giving of this advice.

A. I am not certain whether they were in the employ of complainants at that particular time, but I think they were, and they had been retained for several years under an agreement with the Rubber Tire Wheel Company, one of the complainants.

R. D. Q. 173. For how many years and at what price, if you can state?

A. My recollection is that it was a five-year agreement at a Thousand dollars a year, plus such charges as they might see fit to make for any special work, such as appearing in Court.

R. D. Q. 174. State as nearly as you can when that employment terminated?

A. I think it was in 1902.

Recess until 2 o'clock.

After Recess, 2 P. M.

R. D. Q. 175. I believe you stated on your cross-examination that the Consolidated Company never had a license from the Rubber Tire Wheel Company under the Grant Patent. You may make any explanations regarding that statement you wish.

A. I overlooked the fact that in August, 1902, the Consolidated Rubber Tire Company did receive and take a license from the Rubber Tire Wheel Company under the patent at the same time that several other manufacturers took a license from the Rubber Tire Wheel Company.

R. D. Q. 176. On your cross-examination you have been asked to produce forms of license such as the complainants have used heretofore in their business, I now hand you forms of license agreements and additions thereto, numbered respectively 1, 2, 3, 4 and 5. You may examine them and state what they are.

A. No. 1 is the form of license and agreement providing for the leasing of certain machinery and the payment of royalty for rubber tires used or sold under the patent in suit. This was called a welding form, as it covered the lease of a welding machine. No. 2 is, I think, identical, excepting that it covered a brazing machine instead of welder. No. 3 is a short term contract in which a shop right is granted. No. 4 is a shop right contract covering also the use of the brazer. No. 5 is a price amendment which has been used as an amendment to the preceding forms.

R. D. Q. 177. Summing them up, are they forms of license agreements which the complainants have used in their business?

A. Yes.

R. D. Q. 178. You have also been asked to produce another form of license such as you granted to manufacturers. I now hand you four separate papers marked respectively A, B, C and D, and ask you if they constitute an actual license agreement made by complainants with a Rubber Manufacturing Company and such as at one time you issued to other manufacturers.

A. Yes; this is a form of license issued to the Diamond Rubber

Company by the Rubber Tire Wheel Company and executed by the Diamond Rubber Company and such as we issued to others.

The foregoing papers marked 1, 2, 3, 4 and 5 and A, B, C and D, are now presented to counsel for defendant for his examination and further cross-examination of the witness if he desires to cross-examine thereon.

Defendant's counsel objects to the socalled licenses identified as 1, 2, 3, 4 and 5 as incompetent, irrelevant, evasive and manifestly not representing any actual facts, and objects to the other papers marked A, B, C and D as manifestly on their face as referring to such part of the transaction and without any proof as to acceptance or recognition by the various parties therein identified and as evidently on their face throwing doubt and question upon any question of validity of the Grant Patent in suit and appearing clearly to be a commercial expediency that rather recognizes the invalidity and not the validity of the Grant Patent.

R. D. Q. 179. You stated before recess that you were unable to state when the employment of Messrs. Offield, Towle & Linthicum with the complainants was terminated. You may now state if you have since refreshed your recollection and give the date of termination.

A. I have, and find that the last payment to Messrs. Offield, Towle & Linthicum covered the year 1903.

Defendant's counsel, without prejudice to the objections and notice entered of record, cross-examines this witness solely as to the personal matter which complainants' counsel has seen fit to eject into this record as to the firm of the counsel interrogating, namely, the firm of Offield, Towle & Linthicum.

Recross-examination by Mr. Offield:

R. X Q. 180. You know perfectly well, do you not, that the law firm of Offield, Towle & Linthicum were the counsel and defended in the Courts, certain manufacturers of rubber tire and suits that were brought by one of these complainants on the Grant Patent in suit for an infringement of the Grant Patent?

A. I know that the firm were attorneys for the Firestone Rubber Company in the recent suit in this Circuit.

R. X Q. 181. Yes. And you know some nine years ago they were attorneys for certain defendants that the complainant the Rubber Tire Wheel Company sued in the West for an infringement of the Grant Patent?

A. I do not at all; never heard *of* it.

R. X Q. 182. Do you know anything at all about the first suits that were brought against manufacturers in the Western Circuit by the Rubber Tire Wheel Company for infringement of this Grant Patent?

A. Do you refer to nine years ago?

R. X Q. 183. I do.

A. In a general way I do know about some suits, but I only became connected with the complainant companies in 1899 and I am

not familiar with the names of all the attorneys engaged in those suits.

R. X Q. 184. You know, do you not, that the firm of Offield, Towle & Linthicum defended the Firestone-Victor Rubber Tire Company in a suit brought against that company by one of these complainants the Rubber Tire Wheel Company in the United States Circuit Court for the Northern District of Illinois and which suit is identified in the affidavit of Mr. Samuel N. Pond filed in this case and appearing in the printed record of the U. S. Circuit Court of Appeals upon pages 74 to 78 inclusive, and wherein the testimony in behalf of this complainant in that case and this is quoted at length showing the contradiction between the position and testimony of this complainant in the case pending nine years ago and the position and testimony of the complainant and for the complainant in the later cases?

A. I do not. Not having read the record or affidavit in the record and I never heard of the statement you made before.

R. X Q. 185. You know that the Firestone-Victor Rubber Tire Company settled up that suit and settled it out of Court without trial, do you not, with your accurate knowledge of the history of the litigation of this patent?

A. I don't remember how that case was settled. I only recall that there was some action against that company.

R. X Q. 186. Did you ever know of Mr. Offield or either member of his firm, Mr. Towle or Mr. Linthicum ever standing up in Court or filing a paper in any Court in behalf of or connected with any case of either of these complainants against any person whatever upon the Grant Patent in suit?

A. I don't recall that they appeared actively in Court, but they were consulted, as the bills which they rendered will show.

R. X Q. 187. Then, as a matter of fact, no member of that firm ever filed any brief or made any argument in Court in any suit ever pending to test the validity of the Grant Patent; is that so?—in behalf of complainants?

A. Not to my knowledge.

R. X Q. 188. Now, as a matter of fact, the retainer which the complainants or either of them paid the firm of Offield, Towle & Linthicum for a period of five years was a shelving retainer for the purpose of keeping them out and away from any defense of the Grant Patent; isn't this correct?

A. I can't say. I never heard the matter discussed. The agreement was in existence prior to my connection with the complainants.

R. X Q. 189. Did either member of the firm of Offield, Towle & Linthicum ever attend at the office or any office of either of the complainants in this case except upon the single instance which you have referred to?

A. Not to my knowledge.

R. X Q. 190. Did you ever call upon the firm of Offield, Towle & Linthicum or any one of them for an opinion regarding either the scope or the validity of the Grant Patent in suit, and have you any

such opinion or anything which may be mistaken for any such opinion in your possession?

A. No; I never had any such correspondence with the said firm; and the only time that I know when any expression of opinion was made by any of its members was upon the occasion of Mr. Offield's call, to which I have heretofore referred.

R. X Q. 191. Mr. Seaman, try and refresh your recollection as to that call in this: Do you not remember that Mr. Offield's only call upon you was at a time after the Court of Appeals of the Sixth Circuit had declared the Grant Patent invalid, and the purpose of that call related only to that decision and what the Consolidated Rubber Tire Company should do about it?

A. I can't say what the purpose of Mr. Offield's call was, because I couldn't look into his mind, but I recall distinctly the impression made upon me by the conversation and that was that he considered the Grant Patent a good patent and that he seemed very desirous of entering into active service on behalf of the Consolidated Rubber Tire Company in order to prove his belief in that respect.

R. X Q. 192. We will not talk about impressions, but state as closely as possible the facts. Mr. Offield, at that call, was in no sense the attorney of either of the complainants in this case and the annual retainer you mention had some time since expired at the date of that call; had it not?

A. No, it had not expired, and I understand that the firm was retained as attorneys for the complainants at that time.

R. X Q. 193. Let me refresh your recollection as to the matter. Do you not recollect that Mr. Offield stated to you that he made that single visit to the place of business of the complainants at the request of the late counsel for the complainant, Mr. John R. Bennet, and solely as to the matter and the chances the complainants in this case would have for success in applying for the writ of certiorari to the Supreme Court of the United States by reason of the decision of the Court of Appeals of the Sixth Circuit finding the Grant Patent invalid and by reason of the fact that at that time two District Judges sitting as Circuit Judges had found the Grant Patent valid, and that Mr. Bennet had asked Mr. Offield to state to you his experience and success in obtaining a writ of certiorari under similar conditions in the case of the Singer Manufacturing Company against Cramer, going up from the Circuit Court of Appeals from the Ninth Circuit?

A. I have no recollection as to that having been the specific cause of Mr. Offield's visit, nor do I recall any conversation in regard to the writ of certiorari with Mr. Offield.

R. X Q. 194. You don't remember, do you that Mr. Offield stated to you at that visit that in the case last referred to, he had tried the case three times in the circuit before Circuit Judges in the Ninth Circuit and three Judges at the circuit had declared the Cramer Patent invalid, and that the Court of Appeals of the Ninth Circuit had found the patent valid, thus leaving six Judges equally divided as to the validity of that patent, one of the Judges then being a Justice of the Supreme Court of the United States, and that this grant of the writ of certiorari from the Supreme Court had established a new rule

apparently in the granting of such writ by the U. S. Supreme Court, and that apparently if you could obtain another decision favorable to the Grant Patent, and from the Judge sitting in Georgia, that you would then have precisely the same conditions for the granting of the writ of certiorari that were present in the Singer-Cramer case, and that I expressed the greatest confidence to you gentlemen that the Supreme Court of the United States would grant the writ in the Sixth Circuit case, and urged you to take these proceedings or instruct your counsel to take them and that that was the only fair and right way of determining for the whole country the validity of the Grant Patent; isn't your recollection now refreshed of that fact?

Counsel for complainants calls the attention of the Court to this manifest attempt to inject an argument into a question, and to the fact that the witness has already stated that at the interview referred to nothing was said about writ of certiorari, and the further fact that from the records already in evidence it appears that any such conversation and statement as is implied in the question would have been absurd, as the Georgia Court had already decided in favor of the patent long before any interview at which writs of certiorari could have been referred to in any reasonable view of the situation.

Defendant's counsel states that this was the fact as complainants' counsel now states that the Georgia Court had found the Grant Patent valid before that interview it is entirely evident that the Supreme Court of the United States denied the writ because the case in the Georgia Court was so prepared and presented that the validity of the Grant Patent was admitted in that case, and, therefore, made it impossible for the recognition by the Supreme Court of the rule laid down in the Singer case.

A. I do not recall it.

R. X Q. 195. And you do not recall that your late counsel, Mr. John R. Bennett, obtained a copy of the record of the case of Singer against Cramer on the certiorari proceedings in the Supreme Court of the United States and followed that record in drawing his petition for a writ of certiorari and followed that petition in your case?

A. I don't know what he did in the matter.

Defendant's counsel repeats the notice and objection made to the deposition of this witness as to certain questions and declines to further cross-examine.

Redirect examination by Mr. STAPLETON:

R. D. Q. 196. What is this paper which I now hand you?

A. It is a letter dated Chicago, January 6th, 1904, signed Offield, Towle & Linthicum, to which is attached a bill dated December 31st, 1903, for services rendered the Rubber Tire Wheel Company by Offield, Towle & Linthicum for the year 1903, amounting to $1,000.39.

R. D. Q. 197. Did the complainant company or either of them pay the bill?

A. Yes.

The bill and letter are offered in evidence and marked "Complainants' Exhibit, Offield, Towle & Lithicum's bill to December 31st, 1903."

Recross-examination by Mr. OFFIELD:

R. X Q. 198. This bill you present is the $1,000 annual retainer for the year 1903 and 39 cents for a telegram, isn't it?

A. The bill is for the services rendered as stated in the bill and 39 cents.

R. X Q. 199. And pursuant to a memorandum of retainer and agreement, isn't it?

A. Yes, dated January 25th, 1899.

R. X Q. 200. Can you explain to this Court or any Court, or do you care to explain why you and one of your counsel, the counsel interrogating you in this case, did not inject this personality and this statement of yours and this bill in the long litigation of these complainants against the Firestore Company just decided by the Court of Appeals for the Sixth Circuit, in which my firm defended?

A. I don't know of any particular reason.

Deposition closed.

Counsel for complainants exhibits to counsel for defendant certified copies of articles of incorporation of the complainants' company for his examination, and asks him to consent to a statement upon the record that the complainants are corporations, as alleged in the bill of complaint without requiring putting in evidence of these somewhat lengthy certificates.

Defendant's counsel admits the corporate character of the complainant the Consolidated Rubber Tire Company, but declines so to do as to the Rubber Tire Wheel Company.

In view of the refusal, complainants' counsel offers in evidence a certified copy, the certificate of incorporation of the Rubber Tire Wheel Company, certified to by the Secretary of State of the State of Ohio, September 27th, 1899.

Received in evidence and marked "Complainants' Exhibit, Certificate of Incorporation of the Rubber Tire Wheel Company."

Defendant's counsel objects to this exhibit as incompetent, irrelevant and immaterial, as not properly certified, and for the further and principal reason that it appears by this alleged certificate and as the Third clause or statement of the articles of incorporation as follows:

"Said corporation is formed for the purpose of manufacturing rubber tires for vehicles and doing a general wheel business."

And that from the testimony as shown in this case it is out of the power of such corporate charter or by such corporate charter to this complainant, The Rubber Tire Wheel Company, to conduct litigation, own or hold letters patent or carry on or carry out the performances in which they are now engaged with this patent in suit in direct contradiction and hostility to the powers and duties and obligations identified by the charter itself.

By Mr. STAPLETON: Since, according to the statement of defend-

ant's counsel, complainants haven't any standing in the Court, the complainants rest.

It is stipulated by counsel for respective parties that each party may retain its own exhibits without filing the same subject to examination by the opposite party at any time upon reasonable notice and subject to a motion by either party at any time for lodgment of the same in Court, each party to bear their own expenses attending any examination.

These articles of incorporation of the Rubber Tire Wheel Company, witnesseth, That we, the undersigned, a majority of whom are citizens of the State of Ohio, desiring to form a corporation, for profit, under the general corporation laws of said State, do hereby certify:

First. The name of said corporation shall be the Rubber Tire Wheel Company.

Second. Said corporation is to be located at Springfield, in Clark County, Ohio, and its principal business there transacted.

Third. Said corporation is formed for the purpose of manufacturing rubber tires for vehicles and doing a general wheel business.

Fourth. The capital stock of said corporation shall be Ten Thousand Dollars ($10,000), divided into one hundred (100) shares of One Hundred Dollars ($100.00) each.

In witness whereof, We have hereunto set our hands, this 28 day of May, A. D. 1894.

E. S. KELLY.
A. W. GRANT.
J. W. STAFFORD.
O. W. KELLY.
JNO. M. CUSHING.

THE STATE OF OHIO.
County of Clark, ss:

Personally appeared before me, the undersigned, a Notary Public in and for said county, this twenty-eighth day of May, A. D. 1894, the above named E. S. Kelly, A. W. Grant, J. W. Stafford, O. W. Kelly and Jno. M. Cushing, who each severally acknowledged the signing of the foregoing articles of incorporation to be his free act and deed, for the uses and purposes therein mentioned.

Witness my hand and official seal on the day and year last aforesaid.

[SEAL.] EDWIN S. HOUCK.
Notary Public, Clark County, Ohio.

THE STATE OF OHIO,
County of Clark, ss:

I, D. H. Cushing, Clerk of the Court of Common Pleas, within and for the county aforesaid, do hereby certify that Edwin S. Houck, whose name is subscribed to the foregoing acknowledgment as a Notary Public, was at the date thereof a Notary Public, in and for said county, duly commissioned and qualified, and authorized as such to take said acknowledgment; and, further, that I am well ac-

quainted with his handwriting, and believe that the signature to said acknowledgment is genuine.

In witness whereof, I have hereunto set my hand and affixed the seal of said Court, at Springfield, this 1st day of June, A. D. 1894.

[SEAL.] D. H. CUSHING, *Clerk*,
By FOREST SPEAKS, *Dep'ty*.

SPRINGFIELD, OHIO, *October* —, 1894.

To the Hon. Secretary of State, Columbus, Ohio.

DEAR SIR: The undersigned, the President and Secretary of The Rubber Tire Wheel Co., duly authorized hereunto, do hereby certify that on the 31st day of October, 1894, the capital stock of said Company was fully paid up; that on said day of October, 1894, by a vote of the holders of all the stock of said Company, at a meeting called by a majority of its directors, and held at the office of the Company at Springfield, Ohio, at which meeting all the holders of the capital stock of said company were present in person and waived in writing the notice of publication and by letter of the time, place and object of such meeting required by law, and also agreed in writing, entered on the records, to the increase of capital stock hereinafter set forth, it was on motion

"Resolved, That the capital stock of said The Rubber Tire Wheel Company be increased from Ten Thousand Dollars, its present capital stock, to Thirty Thousand Dollars, divided into 300 shares of $100. each; and, further, that the President and Secretary of said Company be instructed to file a certificate of such increase with the Secretary of State which is accordingly done."

In witness whereof, as President and Secretary of said The Rubber Tire Wheel Company, duly authorized as appears by the above resolution, we have hereunto set our hands this 31st day of October, 1894.

THE RUBBER TIRE WHEEL CO.,
By E. S. KELLY, *Prest.*
THE RUBBER TIRE WHEEL CO.,
By O. W. KELLY, *Sect.*

(*Certificate Under Section* 906, *Revised Statutes of the United States.*)

UNITED STATES OF AMERICA,
State of Ohio, Office of the Secretary of State:

I, Charles Kinney, Secretary of State of the State of Ohio, and being the officer who, under the Constitution and Laws of said State, is duly constituted the keeper of the records of articles of incorporation of all companies incorporated under the Laws thereof, and the records of all papers relating to the creation of said incorporated companies, and empowered to authenticate exemplifications of the same, do hereby certify that the annexed instrument is an exemplified copy, carefully compared by me with the original record now

in my official custody as Secretary of State, and found to be true and correct, of the Articles of Incorporation of "The Rubber Tire Wheel Company," filed in this office on the 2nd day of June, A. D. 1894, and recorded in Volume 63, Page 291; and of the Certificate of Increase of Capital Stock of said Company, filed in this office on the 2nd day of November, A. D. 1894, and recorded in Volume 57, Page 674, of the Records of Incorporations; that said exemplification is in due form and made by me as the proper officer, and is entitled to have full faith and credit given it in every court and office within the United States.

In testimony whereof, I have hereunto attached my official signature and the Great Seal of the State of Ohio, at Columbus, this 27th day of September, A. D. 1899.

[SEAL.] CHARLES KINNEY,
Secretary of State.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by Arthur W. Grant, November 7, 1895, and recorded February 6, 1896, in Liber V-52, page 272.

Said record has been carefully compared with the original and is a correct transcript of the whole thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 29th day of March, in the year of our Lord one thousand nine hundred and seven, and of the Independence of the United States of America the one hundred and thirty-first.

[SEAL.] E. B. MOORE,
Acting Commissioner of Patents.

Liber V-522, Page 272.

Assignment.

Be it known that I, Arthur W. Grant, of Springfield, Ohio, for and in consideration of One dollar and other good and valuable considerations to me paid, the receipt whereof is hereby acknowledged, do hereby sell, assign and transfer unto The Rubber Tire Wheel Co., a corporation of Ohio, having its principal place of business at Springfield in said State, the entire right, title and interest in and to a certain invention devised by me in rubber tired wheels, and in and to the letters patent therefor, which invention is fully described and set forth in an application for letters patent executed by me this day for improvements in Rubber Tired Wheels, and I hereby authorize and request the Commissioner of Patents to issue the patent or patents which may be granted on said application to the said The Rubber Tire Wheel Co. in accordance with this assignment.

The said The Rubber Tire Wheel Co. to have and to hold the said

invention, and the said patent or patents, for itself, its successors, assigns or legal representatives to the full end of the term for which said patent or patents may be granted, reissued or extended, and to a like extent that the same would have been held by me.

Signed and delivered at Springfield, Ohio, this 7th day of November, 1895.

ARTHUR W. GRANT.

Witness,
W. S. HUFFMAN.

Recorded, February 6, 1896.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFCE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by Arthur W. Grant, December 3, 1897, and Recorded December 9, 1897, in Liber I-56, page 454.

Said record has been carefully compared with the original and is a correct transcript of the whole thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this 29th day of March, in the year of our Lord one thousand nine hundred and seven, and of the Independence of the United States of America the one hundred and thirty-first.

[SEAL.]

E. B. MOORE,
Acting Commissioner of Patents.

Liber I-56, Page 454.

Assignment.

Whereas, I, Arthur W. Grant, of Springfield, Ohio, being the inventor of a certain new and useful improvement in Rubber Tired Wheels, for which United States Letters-Patent No. 554,675 were issued February 18th, 1896, did sell and assign before issue to The Rubber Tire Wheel Company, a Corporation of Ohio, having its principal place of business at Springfield, in said State, the invention covered by said letters-patent, and executed an instrument in writing therefor on the 7th day of November, 1895, concurrently with the execution of the application for said letter'-patent, which instrument was recorded in the Patent Office on February 6th, 1896, in Liber V-52, Page 272, of Transfers of Patents; and,

Whereas, notwithstanding said assignment, the said letters-patent were issued in my name and not in the name of said The Rubber Tire Wheel Company; now,

Therefore, in order that the title to said letters-patent may be fully and clearly vested in the said The Rubber Tire Wheel Company and the identity of said letters-patent be clearly established of record, I, the said Arthur W. Grant, do hereby assign, transfer and convey the

entire right, title and interest in and to the said letters-patent No. 554,675, and in and to the invention covered thereby, including all rights for past infringement, to the said The Rubber Tire Wheel Company, its successors and assigns, to the full end of the term for which said letters-patent have been or may be granted, re-issued or extended.

Signed and delivered at Springfield, Ohio, this 3d day of December, 1897.

ARTHUR W. GRANT.

STATE OF OHIO,
County of Clark, ss:

On the 3d day of December, 1897, before me personally came Arthur W. Grant, known to me to be the individual described in and who executed the foregoing instrument, and acknowledged that he executed the same as his own free act and deed.

CHAS. I. WELCH,
Notary Public, Clark County, Ohio.

[Notarial Seal, Clark County, Ohio.]

Recorded, Dec. 9, 1897.

CHICAGO, *Jan.* 6, 1904.

The Rubber Tire Wheel Company, Springfield, Ohio.

GENTLEMEN: Enclosed please find statement of our charges in the Patent litigation matters of your Company, for the year 1903, the amount being in accordance with the agreement between your Company and our firm, dated January 25, 1899, which was executed by your President, Mr. Kelly, and with which he is familiar. We send this statement to your Company, the same as we sent statements for the years 1900, 1901 and 1902.

Kindly have the enclosed audited for payment, and oblige,

Very truly yours,

OFFIELD, TOWLE AND LINTHICUM.

(Enclosure.)

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE CO. and THE RUBBER TIRE WHEEL COMPANY, Complainant-,
against
THE DIAMOND RUBBER CO. OF NEW YORK, Defendant.

Complainants' Proofs in Rebuttal.

Met pursuant to notice at the office of the Consolidated Rubber Tire Company, 243 West 47th Street, New York City, Borough of Manhattan.

Present: Charles W. Stapleton and Thomas W. Bakewell, for Complaintiff-; Philip B. Adams, for Defendant.

Testimony of Philip Ernenwein.

PHILIP ERNENWEIN, a witness called by the complainant-, having been duly sworn, testifies as follows in answer to questions by complainants' counsel:

Q. 1. Please state your name, age, residence and occupation?

A. Philip Ernenwein; 42; 306 West 47th Street, New York City; blacksmith.

Q. 2. Are you in the employ of the complainant company?

Question objected to on the following grounds: First, that the notice served in this case to take depositions, was served on defendant's counsel on the 21st day of January for the taking of the depositions on the 24th, and that that is not a reasonable or lawful notice to take depositions; second, that Mr. Charles K. Offield, who has had charge of taking all the testimony and preparing this case for trial is in attendance in the Supreme Court of the United States in the case of R. G. Dun & Company *vs.* Lumbermen's Credit Association, which case is No. 138 on the calendar; third, that the complainant- gave notice on the record that their proof was closed; fourth, that *it* made a motion to put the case on the calendar for an early trial; fifth, that complainants then withdrew that motion and served this notice to take depositions.

The defendant asks that these objections be noted to each and every question propounded to any witnesses produced for examination today.

A motion was made to Judge Holt this morning, and all of these facts were stated to him and he ruled that the examination of the witnesses might proceed, but that they should appear Thursday morning next, and submit to Mr. Offield's cross-examination.

Complainants' counsel states that the witnesses will be produced on Thursday morning next at this place at 10:30 o'clock for cross-examination.

A. Yes, sir.

Q. 3. What are your duties?

A. Blacksmithing and applying rubber tires.

Q. 4. How long have you been engaged in applying rubber tires for the Consolidated Rubber Tire Company?

A. Either five or six years this spring.

Q. 5. Have you had anything to do with taking off old tires and replacing them?

A. Yes, sir.

Q. 6. How much of this work have you done, how many tires have you placed?

A. Oh, it would run into thousands, I can't tell the exact number.

Q. 7. I show you a cut of the tire marked Kelly Springfield Tire, which is the tire of the patent in suit, how many of those have you placed on wheels?

Objected to unless the cut is marked for identification or offered in evidence.

Complainants' counsel offers the cut in evidence and it is marked Complainants' Exhibit Cut of Kelly Springfield Tire.

Objected to as incompetent, irrelevant and immaterial and on the further ground that the patent in suit is the best evidence of the tire.

A. I have helped and applied thousands of those.

Q. 8. What is the practice in putting those tires on wheels about drawing up the wires, how tight are they drawn?

A. Why, as near in your own judgment as the wires will stand.

Q. 9. Have you seen tires like that cut in use on cabs and vehicles?

A. Yes, sir.

Q. 10. How often?

A. Well, possibly daily.

Defendant's counsel moves to strike out the answer on the ground that the witness is guessing, he says possibly.

Q. 11. Have you seen them very frequently or otherwise?

A. I see them every day.

Q. 12. Now, when these tires are applied with the wires drawn as tight as in the judgment of the man applying them will stand, will you state whether the tire so applied will in use tip sideways; please give the facts on which your answer is based, stating how you know?

Question is objected to on the ground that it calls for the opinion of an expert and that the witness has not qualified as an expert.

A. Well, I have seen them going around a curve do the same thing, as spoken of.

Q. 13. How much will these tires tip when on a vehicle in use?

Defendant's counsel asks that the witness be instructed to answer that question of his own personal knowledge and observation.

(The witness is so instructed.)

A. Well, so that you can see the under corner of the base of the tire above the flange of the channel.

Q. 14. Will this tipping raise the wire with the tire?

A. Yes, sir.

Q. 15. In order to test this question can you apply rubber tires such as shown in the cut in evidence with tires drawn as tight as they can be drawn without breaking and apply stresses to the tire of the same kind as they would receive in the street, so that we may see what happens?

Objected to on the ground it calls for the opinion of an expert, and the witness is not qualified to testify. And on the further ground that it calls for his opinion and not for any facts.

A. Yes, sir.

Q. 16. Will you please now do so and apply these tires with soft wires and hard wires respectively, and then tell us what you do, and what happens?

Question is objected to on the ground that it asks the witness to

apply these tires and there is no way that such a performance can be placed on the record.

A. Why, the tire was put on as tight—the tire with the soft wires was put on just as tight as the wires would possibly stand. Inch and three-quarter tire. The length of rubber twelve foot nine inches. With a machine that has been in the use of the company seven years to my knowledge, for putting on tires; the machine that we regularly use in our business. Those wires were united with an electric welder. The wheel was removed from the welding machine and the joint closed.

With the other wheel we used copperized wires, which is much harder than the one we welded, and we connected those with brass—we brazed the other, and it was taken from the brazing machine and closed the same as the first one.

Q. 17. What was the size of the second wheel and the size of the tire?

A. Inch and three-quarter tire; rubber twelve foot nine inches long.

Q. 18. How tight did you draw the wires of the second wheel?

A. As tight as in my judgment the wires would stand. They were No. 8 wires.

Q. 19. Did these machines have special appliances for drawing the wires tight?

A. No, sir; they are used in every day work.

Q. 20. What were these appliances for drawing the rubber tight?

A. The wires are put in a clamp which is connected to the end of a screw, which runs through a sleeve with threads to correspond to the screw. On the end of the screw is a wheel about 15 or 16 inches in diameter and on the machine *they* are four jaws, one end of the wires *are* clamped into two of the jaws, the rubber and wire thrown around the wheel between the other two jaws into this clamp on the end of the screw and tightened in the clamp. The second two jaws are left a little loose so in turning the screw the wires will pass through and compress the rubber, also tighten the wires to the proper tension; then the second jaw is clamped with screw and wires cut off between four jaws, proper length for welding.

Defendant's counsel moves to strike out the answer on the ground that the machine and the process of applying tires is entirely without the issue in this case.

Q. 21. Does the screw with the hand-wheel 16 inches in diameter afford means for drawing the wires tight around the wheel?

Same objection.

Q. (continued). How tight can you draw the wires with this machine?

Same objection.

A. You can break those wires very easily.

Q. 22. And I understand your testimony is that on these particular

wheels you drew the wires as tight as you thought they could stand without breaking?

Same objection.

A. Yes, sir.

Q. 23. When you had the tires applied to these two wheels, what did you do with the wheels?

Objected to as immaterial.

A. Why, we put them into a vise, and get on a bench, the wheel setting in the vise, without being clamped, just loosely set in to show the tire set in a slot; a man got on the bench and twisted the wheel about the same as it would—something the same as it would get in use. After that we screwed the rubber tightly into the vise, letting the wheel lie over toward the back of the bench, possibly the top leaned over two feet from a perpendicular point. It showed the base of the rubber raised up to the top of the flange which the rubber was applied in.

Defendant's counsel moves to strike out that part of the witness' answer in which he states placing the wheel in a vise and tilting it to one side would show practically the same results or "something the same as it would get in use," on the ground that it is purely an opinion without stating a fact.

Q. 24. In these two tests which you have described what part of the wheel was in the jaw of the vise?

A. The rubber tire was between the jaws.

Q. 25. Was the tire clamped tight in both tests?

A. No, sir. The first test the rubber was dropped in the vise freely so it rested on the edge of the flange on the jaws of the vise.

Q. 26. What extent, if at all, did the twisting and tipping of the wheels when the rubber was in the jaws of the vise, lift the wires out from the wheel rim?

Defendant's counsel here gives notice that they will move to strike out all testimony of this witness in relation to any tests that were made on this date on the ground that these tests were made long after his suit was commenced, and that they have nothing to do or are not material to the issues raised in this case.

A. Of course, we didn't measure, but to the best of my knowledge at that point it raised the wire a quarter of an inch.

Q. 27. How near did it lift the wire to the level of the rims of the channel on the wheel?

A. It lifted the wire so you could stick a penknife under the lower side of the wire on top of the flange of the channel.

Q. 28. When the strain on the tires was released by lifting them from the vise what happened to the rubber tires? Did they stay in their displaced position?

A. They did not.

Q. 29. What did they do?

A. With the exceptions of a slight chafing on the tire you would not know that — had been in the vise.

Q. 30. Did they go back to their seats in the rim of the wheel?

Objected to as leading.

A. As far as was visible.

Q. 31. What kind of wheels did you use for these tests?

A. The size of the wheel would be used on the rear wheel of a cab.

Q. 32. I wish you would state whether the strains to which you put the tires in these tests were any greater or more severe than those to which tires are subject in use on the cabs, and under what circumstances would the tires receive such strains in use?

Objected to on the ground that it has not been shown that the witness has any personal knowledge of the strains that tires are subjected to in use on cabs and vehicles, and on the further ground that it calls for the opinion of an expert and the witness has not been qualified as such.

A. In this case in testing I wrenched the wheel out of the vise myself without disfiguring the rubber in any way with the exceptions of a little chafing. We have had wheels that have had rubber tires applied, come into our shop with pieces torn out of the rubber, which the drivers would claim were caught in car tracks. Other cases the tire has been completely torn from the wheel. My judgment is that that is a harder test on the rubber than we made on these present wheels.

Defendant's counsel moves to strike out the answer on the same grounds as made in my objection to the question and also move to strike it out particularly on the ground that he is stating something that drivers came in the shop and stated to him, and obviously is not testifying from his own personal knowledge.

Q. 33. Can you tell from the looks of tires that are brought in torn, that they have been caught between something?

A. Yes, sir.

Q. 34. If a cab were driven sharply against the curb how would the twisting effect compare with the test you made?

A. If it were driven absolutely straight it would not have the same effect, but if a very little on a slant it would affect it to my opinion more severely, because it would be very apt to cut the rubber.

Q. 35. And state whether driving the wheel on a slant against the curb would have a like twisting and tipping effect on the tire?

A. It surely would.

Q. 36. Are tires more apt to tip sideways in their rims when the vehicle is heavily loaded or when the pressure on them is lighter? Did your tests show anything on this point?

A. They are apt to tip more under the strain of a load. It showed with a little weight on the wheel placed in the vise and in twisting raised the base of the rubber a trifle more than without any pressure at all.

Q. 37. How heavy is the ordinary hansom cab?

A. Why, about 2,000 pounds, I think—1,800 to 2,000.

Q. 38. You have said that you have frequently removed old tires

from the wheels, tires of the kind shown in the cut in evidence, about which we have been talking. Do the metal rims of these wheels give any indication that the tires have had a lateral tipping motion, and, if so, explain?

A. Every indication.

Q. 39. Please explain what they show?

A. We have wheels come in for new tires; the tire has probably been on the vehicle a year and possibly eight or nine months, and is so grooved out at the out-edges of the base of the channel, that it is necessary to put on a new channel before applying another tire on the same wheel.

Q. 40. Can you tell from the appearance of these rims what kind of motion of the tires has grooved them?

A. A rocking motion.

Q. 41. Can you produce one of these rims so we can see what you mean?

A. Yes, sir.

Q. 42. Please do so?

A. Here it is.

Complainant's counsel offers in evidence the old rim produced by the witness, and it is marked Complainant's Exhibit Worn Rims, the witness having produced several of them.

The rims are objected to on the ground as not shown to have anything to do with the patent in suit, and not shown that the Grant tire was applied to them, and on the further ground that the rim as shown by the witness is only a channel iron and has nothing whatever to do with the issue in this case.

Q. 43. What kind of tires were used on these rims?

Defendant's counsel asks that the witness be instructed to answer this question of his own personal knowledge.

A. Same shape as the Kelly Springfield Tire.

Q. 44. Is this grooving of the base of the rim, which is apparent on this exhibit, an unusual thing on an old rim?

A. No, sir, it is not unusual.

Q. 45. How common is it?

A. I daresay any rubber that is worn out with the internal rubber tire, show the same effect on the base of the channel.

Q. 46. I notice that the edges of this rim are battered down somewhat. What causes that; when it happens is anything done to correct it?

A. In some cases where the burring over of the flange is too bad which if it is burred over too much in taking off the burr, makes a flange too low to apply a new tire in.

Q. 47. If the burring isn't too bad what do you do with it?

A. We put the wheel with the channel on an emery stone, and grind off the burr.

Q. 48. You have said that you have applied tires and tested two wheels, one with ordinary soft wire and one with hard wire did the character of the wire make any difference in the tendency of the tire to tip on the lateral strain?

A. Not in the least that I could see.

Q. 49. Did you make a third test with a similar wheel and tire applied with extra hard wires? And if so, how did it differ?

A. Yes, sir. There could be no difference detected whatever.

Q. 50. How tight did you draw the wires on this third wheel?

A. The same according to my judgment as the rest.

Q. 51. Were the wires on this third wheel as hard or harder than wires used in practice on internal wire tires?

A. The second wheel are copperized wires, which are somewhat harder than the wires we use for welding purposes, but I dare say, nine out of every ten people who apply rubber tires to-day or for a few years back, use the softer wire, such we use in the welding, on the first wheel. The third wires were the hardest wires that are made for applying tires, which is the Firestone side-wire tire. I dare say there never was such wire used in an interior wire tire.

Defendant's counsel moves to strike out the answer as the witness is obviously not testifying from his personal knowledge.

Q. 52. Who witnessed these experiments that you have testified about?

A. Mr. Roberts, Mr. Philip Adams, defendant's attorney, Mr. Burjison, Mr. Bakewell and Mr. Stapleton.

Q. 53. Will you produce the two wheels on which you made these tests?

A. I will do so.

Complainant's counsel offers in evidence the wheels produced by the witness and they are marked Complainant's Exhibit Tested Tires Nos. 1 and 2, No. 1 being the wheel with the softer wires which were electrically welded.

Defendant's counsel objects to the admission of these wheels in evidence on the ground that they were produced and the tires applied to them long after this suit had been commenced. And on the further ground that it is *ex parte* testimony produced by the complainant.

Q. 54. Were the tires on these two wheels just produced applied in the presence of the persons whom you named in answer to Q. 52?

A. Yes, sir.

Q. 55. How long has the Consolidated Rubber Company used the wire which you describe as the soft wire?

A. I know personally that they have used it for five or six years.

Q. 56. In repairing tires the tires that come into your factory are tires made by a large number of manufacturers, are they?

A. Yes, sir.

Q. 57. And do you know from repairing these old tires what kind of wires other manufacturers use in applying the tires?

Objected to as being immaterial what kind of wires other manufacturers use.

A. Yes, sir.

Q 58. How general is the use of this softer wire among the tire manufacturers?

Objected to on the ground it is immaterial what kind of wire other manufacturers use.

A. Why, we ship it to all of our customers, which amounts to a good deal. I daresay that the great majority are the same wire we use, the soft carbon wire.

Defendant's counsel moves to strike it out as an opinion and does not state a fact.

Mr. Adams says that Mr. Offield is in attendance in the Supreme Court of the United States, and that Mr. Adams has an engagement to try a case before Mr. Justice Keogh at New Rochelle, to-morrow morning, and it is requested in view of these facts that the further examination of the witnesses be postponed until Monday morning at 11 o'clock at the same place.

Adjourned until Monday morning, January 27th, 1908, at 11 o'clock A. M.

NEW YORK, *January 27th*, 1908—11 a. m.

Met pursuant to adjournment, at the offices of C. W. Stapleton, 220 Broadway, New York City.

Present: Counsel as before.

The defendant's attorney gives notice on the record that it will move to suppress the whole deposition of the witness, Philip Ernenwein on the ground that none of his testimony is proper evidence in rebuttal and that the time for the complainants to take testimony in rebuttal has expired and no order of the Court has been obtained to take such testimony.

And thereupon, Mr. EDMUND S. ROBERTS, a witness produced on behalf of the complainants, being first duly sworn, testified in answer to questions by Mr. Stapleton, as follows:

Q. 1. Please state your name, age and residence?

A. Edmund S. Roberts; 40; Yonkers, New York.

Q. 2. What is your occupation?

The question is objected to on all the grounds set forth in the objection to Q. 2 of the witness, Philip Ernenwein, and on the additional ground that the time to take testimony in rebuttal has expired and that no order of the Court has been obtained to take such testimony.

A. I am manager of the New York branch of the Consolidated Rubber Tire Company.

Q. 3. How long have you been in the rubber tire business?

A. About 11 years.

Q. 4. How long have you been manager?

A. About the last six years.

Q. 5. You may state whether or not you have had occasion to study closely the practical and theoretical features of the rubber tire business, during the time you have been engaged in it.

A. Yes, I have.

Q. 6. State whether or not you have made studies of the business and have invented and taken out patents for improvements therein?

Objected to as it doesn't appear that the patent Mr. Roberts has taken out is the patent in suit.

A. Yes.

Q. 7. Please state approximately in round numbers about how many rubber tires of the Grant type have been applied under your immediate direction as manager?

Objected to on the ground it is not rebuttal.

A. Probably 50,000.

Defendant's counsel moves to strike out the answer on the ground the witness is guessing, by using the word "probably."

Q. 8. State whether or not as manager it is your business to see that the tires applied at your place of business are properly applied?

A. Yes, it is.

Q. 9. State whether or not you make personal examinations to see that they are so applied, and if so, about how frequently.

A. Yes, I make personal examinations, not however at any stated periods, but occasionally, from time to time, sometimes every day, sometimes at periods of a week or two or three weeks.

Q. 10. State whether or not you are familiar with the methods employed by your competitors in applying tires of the Kelly type?

Objected to on the ground as not rebuttal.

A. Yes, I am.

Q. 11. Were you present and did you witness the application of the tires to the wheels being Complainant's Exhibits Tested Tires No-. 1 and 2?

A. Yes.

Q. 12. Were you also present and did you witness the experiments made with these tires?

A. Yes.

Q. 13. Were you also present when photographs of some of the tests were taken?

A. Yes.

Q. 14. You may state where these tires were applied, by whom they were applied, when they were applied, and who were present?

A. They were applied at the New York branch of the Consolidated Rubber Tire Company, 243 and 245 West 47th Street, in the regular shop; by Philip Ernenwein, with the assistance of a helper; and they were applied January 24th, 1908, in the presence of Mr. Adams, attorney for defendant, Messrs. Bakewell and Stapleton, attorneys for complainants, myself, and the helper.

Q. 15. Were these people you have mentioned all present when the tests were made as described by Mr. Ernenwein?

A. Yes.

Q. 16. Where were the tests made?

A. They were made in our shop at 243 West 47th Street, and in the yard adjoining the same.

Q. 17. And were all the people present you have mentioned when the photographs were taken?

A. Yes, they were, except Mr. Adams who was somewhere about the premises, saying it was too cold and went inside.

Q. 18. You may state whether or not these tires were applied by the methods now usually employed for the application of tires of this type?

A. They were applied in the usual way.

Q. 19. Briefly describe the method by which the tires on these exhibits were applied?

Objected to as incompetent, irrelevant and immaterial and not being proper rebuttal, and as being an *ex parte* proceeding on the part of the complainants to produce evidence in its own favor.

A. There are two methods; the first one I will describe as the electric welding process. Two wires of the same length having been inserted in the rubber, one end of these wires are clamped in a vise which is a part of the applying machine, and the rubber is then placed in position around the wheel, in the channel, and the wires are then drawn up by a screw in a sleeve; on the end of this screw being a clamp, to which the free end of the wire is fastened. The screw is operated by a wheel, and the tire can be drawn as tight as is necessary to the channel. After the rubber is in this position the wires are cut to the proper length and electrically welded in the same machine. The other method is exactly the same, excepting that instead of welding the wires they are brazed together. Then the rubber is drawn together over the exposed portion of the wire and the ends cemented.

Defendant's counsel moves to strike out the answer on the ground it describes an operation that occurred long after the commencement of this action; on the further ground it is not rebuttal.

Q. 20. State whether or not this method of application is the one employed by your competitors in the application of tires of the Grant type?

Objected to unless it confines to the witness' personal knowledge of the application of tires by the Diamond Rubber Company of New York.

A. Our competitors use the same method, but confine their fastening to brazing.

Defendant's counsel moves to strike out the answer unless the witness confines it to his personal observation the application of tires by the Diamond Rubber Tire Company of New York.

Q. 21. How tightly were these tested tires No. 1 and 2 applied?

A. They were as tight as it was safe to draw the wires, and satisfactory to me as manager, if they were intended to go to a customer.

Q. 22. What is the practice or rule, if any, that prevails as to the tightness with which these tires are applied?

A. There is no rule; a man has to gain that knowledge from experience, as the machines are capable of pulling the wires apart, or breaking them, and a workman usually draws these wires just so tight that they will not break, as tightly as possible without breaking them.

Q. 23. Were these tested wires No-. 1 and 2 in your judgment applied as tightly as possible without breaking the wires?

A. They were.

Q. 24. You may state what quality or sort of wire was used?

A. In the tire No. 1, which was electrically welded, the wire was of the quality which the Consolidated Rubber Tire Company has regularly used for over ten years in applying tires, and that which we supply most of to our customers. The wires in No. 2 are a little different in that they are harder, and copper covered; some people prefer them to the other, but we do not sell as many or as large a quantity as we do of the wire for electric welding.

Q. 25. The wires in Exhibit No. 2 have been described by the witness Ernenwein as "copperized," and by yourself as copper-covered. Describe more particularly what is meant by these terms?

A. The wire is covered with a coating of copper, so as to prevent, if possible, rusting.

Q. 26. Is that coating a mere wash or has it any considerable thickness?

A. I should say it was more in the nature of a wash and very thin.

Q. 27. After these tires were applied to what tests were they subjected?

Objected to on the ground that it is not proper rebuttal and on the further ground that these tests were *ex parte* proceedings to create evidence in favor of the complainant, and long after the commencement of this suit.

A. The rubber on the wheel was placed in a vise and the vise clamped up so as to grip the rubber and the wheel tipped away from the perpendicular so as to draw the rubber away from the channel, and it did so.

Q. 28. Was this done with each of these exhibits?

A. Yes.

Q. 29. State whether or not they were also put loosely in the jaws of the vise, and whether the wheel was then twisted to see what the effect would be?

Same objection.

A. The rubber was put in the vise loosely and the wheel twisted so that the rubber was drawn away from the base of the channel.

Q. 30. Please state what effect this pulling away or pulling on the rubber had upon the wires?

Same objection.

A. It displaced the wires from the position in which they were in before the test was made, by disturbing the rubber.

Q. 31. State as to whether or not the strain operated to lift the wires from their normal position?

Same objection.

A. Yes, it lifted the wires away from the position they were originally in when the tire was applied.

Q. 32. To what extent?

In order not to encumber the record defendant's counsel makes the same objection to this whole line of testimony.

A. From one-eighth to a quarter of an inch.

Q. 33. State whether or not you have on other occasions made similar tests to see what effect a strain on the rubber produces on the retaining wires as to their being lifted from their normal position?

Same objection as noted and the additional objection that the witness can only testify to his personal observation of the actual use of these tires on vehicles and not when they are put in a vise.

A. Yes. On one occasion we tested a tire by clamping the rubber in a vise and tilting the wheel over; the vise was clamped to the rubber close to the end or joint; the ends of this rubber were not entirely locked together. They remained open so that the wires were visible, and when the wheel was tilted I placed a straight edge which had a bearing on flanges of the channel, and by this means I was able to see that the wire did move, in fact it moved from its normal position and touched the straight edge at this point, which was some four inches from the center of the vise which gripped the rubber.

Q. 34. State whether or not there were a number of these tests made in your presence at various points in the circumference of the tire?

Defendant's counsel desires to renew his objection to this whole line of testimony as to tests made in a vise.

A. Yes, there were.

Q. 35. You may state whether the result was in each case practically same, and, if not, how it differed?

A. The result was the same, and clearly showed that the wire was moved from its normal position.

Q. 36. In your judgment, how did this strain to which the rubber tire was subjected compare with the strains that a similar tire would receive in actual use in twisting out of car tracks, in butting up against low curb stones, or in being twisted around on a pivot when loaded or other strains that a tire receives in use?

Defendant's counsel makes the same objection, and in addition that it is not rebuttal.

A. The strain brought upon the rubber in the tests was, in my judgment, not so great as many tires receive in actual use. As evidence of this, tires are sometimes returned to us for repairs which have been torn and from which a piece has been torn out, and the rubber usually will show evidence of what has happened to it to cause the injury or mutilation.

Q. 37. Some of the witnesses for the defense have testified in this case that it frequently happened that tires come back to them in good condition except that at some particular point the rubber has been terribly torn by severe strains in using, which is sometimes sufficient to and has broken the wires, and one witness, at least, that the force supplied was sufficient to break the channel. How do these statements agree with your experience?

Objected to on the ground as not a proper method of contradicting any of the defendant's witnesses; that the witness might testify to his own experience but it is improper for him to characterize testimony given by witnesses for the defense.

A. Why, I should agree with the testimony that you have just outlined.

Q. 38. Please state what you did, if anything, in testing a rubber tire of the Grant type, applied with particularly stiff or hard wire? And explain about the wires particularly.

A. We applied a tire in our regular shop, with a very high carbon wire, which is unusually hard, and designed for use on side wire tires only, where the wire is exposed, and is not used so far as I know in any interior wire tires, because its hardness makes it objectionable in the application. We applied a tire with wires of this kind and tested it in the manner which I have previously applied as to Exhibits No-. 1 and 2, and the result of the test showed that this wire could be moved and was moved from its normal position after the tire was applied.

Q. 39. Were the results of the test on the tire applied with the extra hard wire the same as those with the softer wire?

A. The results were the same.

Q. 40. Did you have a photographer present and were photographs made by him of the Complainant's Exhibits Tested Tires Nos. 1 and 2?

A. Yes.

Q. 41. Have you the photographs with you which were so made?

A. Yes.

Q. 42. What is this photograph which you now produce?

A. This is a photograph of Exhibit Tested Tire No. 1.

Q. 43. What does it show?

Defendant's counsel objects to the witness testifying to what a photograph of an exhibit shows, on the ground it is secondary evidence, and on the ground that the exhibit itself, if it is admissible in evidence, is the best evidence, and there is no reason shown why the exhibit cannot be physically produced in Court.

A. It shows the rubber clamped by a vise, and the wheel tilted back, so that the base of the rubber is visible, above the top of the channel.

Photograph offered in evidence and marked Complainant's Exhibit Photograph of Tested Tire No. 1, Showing Displacement.

Same objection made to the admission of the photograph in evidence, and on the further ground that there is no evidence to show

that it is an accurate and correct reproduction of a section of the exhibit, and no evidence shown that the photographer was sworn to make such a reproduction.

Q. 44. What is this second photograph which I now hand you?

The same objection is noted to each of these questions and the offer of these photographs in evidence.

A. This shows the same wheel with the rubber released from the clamp, at the same point.

Q. 45. When was this second photograph taken?

A. Immediately after the first, after the clamp had been removed.

Photograph offered in evidence and marked Complainant's Exhibit Photograph of Tested Tire No. 1, showing tire reseated.

Q. 46. State whether or not the tire shown resumed the position shown in the photograph itself or was it aided in any way to take this position?

A. The tire went back to its normal position without an aid.

Q. 47. State whether or not it sprung back to its normal position immediately upon the vise being loosened.

A. It sprung back as soon as released.

Q. 48. I now show you two other photographs of the same character and ask you what they are?

Same objection as heretofore made to evidence of this character.

A. They are photographs made of the Tested Tire No. 2, which contained the harder wire, made immediately after the first two photographs shown me were made, and at the same place, showing in one of them the tire displaced by operation of the tilted wheel and in the other a section of the same wheel at the same place showing the tire released and back in its normal position.

Q. 49. Did this tire shown in the last photograph shown you, reseat itself as you have said the first tire did?

Same objection to this whole lines of testimony.

A. Yes, it reseated itself without aid as soon as it was released from the clamp.

Q. 50. Were these wheels marked in any way so as to show that the photographs were taken of the same sections of the wheel?

A. Yes, I marked the wheel with the hard wire with crosses on the wheels and side which are shown in the photograph and Mr. Stapleton marked the other wheel, the one with the regular wires, which marks being crosses, also show in the photographs.

Q. 51. You may state whether or not in your judgment it is possible to apply tires of the Grant type with internal wires so that in use or testing the retaining wires cannot be lifed out of their normal position?

A. In my judgment it is impossible to apply a tire of the Grant type so that the wires may not be moved from their normal position, by service or a test.

The last two photographs shown to the witness are offered in evi-

dence and marked respectively Complainant's Exhibit Photograph of Tested Tire No. 2.

The same objection is made to the admission of these photographs in evidence as was made to the previous photographs.

Adjourned to Thursday, January 30th, at 11 o'clock, A. M., at the office of the Consolidated Rubber Tire Company, No. 243 West 47th Street, New York City, for the cross-examination of the Witnesses Philip Ernenwein and Edmund S. Roberts.

NEW YORK, *January 30th*, 1908.

Met pursuant to adjournment, at the office of the Consolidated Rubber Tire Co., No. 243 West 47th Street, New York City.

Present: Mr. C. P. Byrnes, for Complainant.

No appearance for defendant.

It appearing that Judge Holt has directed the cross-examination of the witnesses to be suspended until Tuesday, February 4th, 1908, the proceedings are therefore adjourned until that date at 11 o'clock A. M., at this place.

NEW YORK, *February 4th*, 1908—11 a. m.

Met pursuant to adjournment at the offices of Charles W. Stapleton, 220 Broadway, New York City.

Present: Messrs. Bakewell and Stapleton, for Complainant. Messrs. Offield and Adams, for Defendant.

Pursuant to the orders made by Judge Holt, complainant now produces for cross-examination Mr. EDMUND S. ROBERTS.

Cross-examination by Mr. OFFIELD:

X Q. 52. When and where were you first connected with the rubber tire business?

A. In New York; with the American Rubber Tire Company, about 1896.

X Q. 53. How long and where next?

A. With the Rubber Tire Wheel Company.

X Q. 54. Your whole business life then with rubber tires has been either with the complainant or its predecessors, is that it?

A. With the complainant or the American Rubber Tire Company and the Rubber Tire Wheel Company.

X Q. 55. Are you a stockholder in either of the complainants?

A. No, sir, I am not.

X Q. 56. How much salary do you get?

Objected to as wholly incompetent and the witness is advised not to answer unless he feels inclined to do so.

X Q. 57. The performance you went through with your blacksmith in equipping a couple of wheels with rubber tires as you have described in your deposition, was a kind of family affair, wasn't it; there was nobody around, except those who expected to give the depositions if they were given?

A. No, it was not; I shouldn't say so; it was done in our shop and all of our employees there had access to the room.

X Q. 58. That's what I meant, and the day was a very cold day when you applied the wires in the tires to wheels, was it not?

A. I think it was a cold day.

X Q. 59. And a blizzard was in progress in this city at that time, was it not?

A. I think it was about over.

X Q. 60. The wires were applied in a cold room with the temperature of the outside, were they not?

A. No, sir; both rooms are steam-heated.

X Q. 61. And the wires were warm then?

A. The wires were such as we ordinarily use in our business every day in exactly the same conditions.

X Q. 62. And they were brittle with the cold then?

A. I should say not; they were in exactly the same condition as we use them every day, under similar weather conditions.

X Q. 63. And you can stretch a wire tightly in a brittle condition with the cold, can you, on one of these wheels?

A. Yes.

X Q. 64. Did you have anything to do personally with stretching these wires with the machine on the two wheels?

A. No.

X Q. 65. You stated in your direct-examination that these tests were made at No. 243 West 47th Street in your shop and in the yard adjoining the same, and now you swear they were made in a steam-heated room. Have you any explanation to make?

Objected to and the attention of the Court is called to the misstatement of the facts and of the testimony given by the witness.

A. I testified that the tires were applied in the steam-heated rooms; that they were not applied in the yard, but that the tests were made in both places.

X Q. 66. In either of those two tests, as you call them, were the wires drawn so tight that they cut into the rubber?

A. I think not; it is hard to say whether they cut into the rubber or not, but I should say not.

X Q. 67. Can you draw the wires so tight that they will cut into the rubber?

A. It is hard to say whether they can or not, without dissecting the tire, and I have never done that because I believe that they do not cut the rubber but that they displace it.

X Q. 68. What you believe makes no difference, but do you know whether these wires can be drawn so tight that they will cut into the rubber?

A. In my judgment they cannot be.

X Q. 69. The question is do you know?

A. I have never seen any.

X Q. 70. And you don't know whether they cut or not?

A. I have never known the wire to cut the rubber in all my rubber tire experience, from drawing it as tight as it should be in applying the tires.

X Q. 71. Just answer the question: Do you know whether these wires can be drawn tight enough to cut the rubber?

A. I have answered the question.

X Q. 72. How have you answered it, whether you know or you don't?

A. Do you want the answer repeated?

X Q. 73. No, I want you to answer the question. I am asking of your own knowledge not what as an employee of the complainant you think what they want, but I want your own knowledge, if you have any?

Objected to as insulting to the witness and as already fully answered.

A. I have already answered the question.

X Q. 74. How have you answered the question, no, of your own knowledge that the wires cannot be drawn so tightly as to cut into the rubber in placing the tires by the machine?

Objected to, that the answer shows for itself the record already shows what the answer is.

A. I can only repeat my former answer.

X Q. 75. And that is that you don't know personally, is it?

A. I didn't say so.

X Q. 76. Well, do you know personally by tests with that object in view whether the wires can be drawn tightly or not to cut into the rubber?

A. I have never known in my rubber tire experience a wire to cut the rubber from being drawn tightly in applying it. And it is my business to see the tires are put on properly and in a satisfactory manner so that the customer is satisfied, and I do not believe the rubber is cut by the wire at the time the tire is applied.

X Q. 77. The different qualities of the rubber would depend and determine whether the wire would cut into it in being drawn so tightly as it can be without breaking, would it not?

A. Not necessarily.

X Q. 78. But you could have some qualities of rubber in the tire that the wire would cut when drawn as tightly as you could on the wheel, without breaking, couldn't you?

A. Not in what I would call a satisfactory rubber tire.

X Q. 79. But you could have a rubber of this quality that would cut with the wire and by the wire drawing as tightly with the machine as you can without breaking?

A. I am not a rubber tire expert or a mixer of rubber, and my experience is confined to good carriage tires.

X Q. 80. And the poor and cheaper kinds of tires you have no experience with, is that it?

A. Except as I see them furnished by others.

X Q. 81. And do you know personally of your own knowledge whether the poor or cheaper kinds of tires can be cut with the wire when fastened to the wheel by these machines?

A. I don't think they would be.

X Q. 82. But you don't know anything about it, is that it?

A. I have already answered that question.

X Q. 83. These machines you put on the rubber tires with, can strain the wire so tightly as to break them, can't they?

A. Yes.

X Q. 84. And do you think that the wires will break before they will cut into the soft rubber?

A. Yes.

X Q. 85. Even poor rubber?

A. Yes.

X Q. 86. Is there any gauge on these machines by which the workmen putting on the tires can tell when the breaking point is reached or not?

A. No, there is not.

X Q. 87. As I understand you, when you put these wheels or the rubber tires of these wheels in a vise in one test you tightened the jaws of the vise so tight that they grasped and mutilated the rubber tire into the position shown in two of the photographs, the first and next to the last photographs bound in the record, did you?

A. The tires were not mutilated in any way, but they were gripped by the vise.

X Q. 88. And distorted into the position shown in the photographs, were they?

A. The rubber was raised from the channel as shown by the photographs.

X Q. 89. But the rubber of the tire itself was clamped and suaged into the position shown by the grip of the jaws of the vise, was it not?

A. Yes.

X Q. 90. And then to pry the rubber away from the wheel with the vise holding it permanently in position you did what?

A. Tilted the wheel back; in some tests other than the ones photographed we tilted it back and let the rubber come out of the vise when it reseated itself in its former position. The vise did not grip the rubber so tightly in that position that we could not remove it without injuring the rubber.

X Q. 91. This photograph shows now how the vise gripped and distorted the rubber; what I want to know of you now is what you did with the wheel when the vise had the grip on it as shown in these photographs?

A. I meant to include that in the other answer; we tilted it back out of the perpendicular line.

X Q. 92. Then you didn't tip the wheel back but you jammed it over sideways while this grip was on the rubber tire as shown in this photograph, is that it?

A. I don't know whether you call it back or sideways, but the photograph to me shows clearly what was done, that the wheel was allowed to go back from its perpendicular position. You can call it back or sideways as you please.

X Q. 93. When the wheel was in its natural position in this grip of the vise it was perpendicular, was it?

A. Yes.

X Q. 94. And how much did you jam it sideways from the perpendicular to produce the picture you show in this photograph?

A. The wheel was tilted back about 18 inches—20 inches maybe.

X Q. 95. Maybe three feet, wasn't it?

A. No, it wasn't three feet; it wasn't over two feet; and in my judgment it wasn't over 20 inches, but I didn't measure it.

X Q. 96. Supposing this had been the wheel of a cab how high would the other cab wheels have been raised off the ground, a two-wheeled cab I mean when you pushed this wheel shown in the vise out of perpendicular two feet?

A. Well, I don't know, without figuring it up.

X Q. 97. The cab would have upset, wouldn't it?

A. No, I think not.

X Q. 98. You don't pretend to say, do you, that in the actual use of a cab one of the wheels ever tip out of the perpendicular two feet, do you?

A. No, I didn't pretend to say that.

X Q. 99. And you never saw in actual practice anything that looked like either this first and last photograph happen in the use of a two-wheeled cab, did you?

A. I have seen pieces of rubber torn from a tire which evidently indicated by the condition of the wheel that the pieces were torn forcibly from the tire.

X Q. 100. Of course, but you never saw any tire in actual use on a cab or anything else that was suaged out of position as shown by this grip of the vise and the wheel that it was on pushed two feet out of the perpendicular, did you?

A. I don't think it would be necessary for the wheel to be two feet out of perpendicular in order to produce the result shown in the photographs.

X Q. 101. Answer the question, and don't tell what you think, unless you know.

A. What was the question then?

X Q. 102. (X Q. 100 repeated.)

A. No, I never did.

X Q. 103. You have testified that you in one of these tests relaxed the grip of the vise on the rubber tire so that the tire fitted loosely in the jaws of the vise, have you?

A. I don't remember; I think I testified to that.

X Q. 104. And then you testify as I understand you that in that condition you twisted the wheel so that the rubber was drawn away from the base of the channel?

A. Yes, we did that.

X Q. 105. The same vise shown in the photograph?

A. Yes.

X Q. 106. How wide was the jaws of this vise?

A. Four inches.

X Q. 107. And how deep down between the jaws of the vise did the rubber tire extend before you began the twisting operation?

A. The rubber was just set loosely in the vise so that it wasn't

pinched in any way; I suppose it might have been in the vise half an inch.

X Q. 108. Well, did the flange of the rim containing the rubber rest on the jaws of the vise?

A. In which test are you referring to?

X Q. 109. I am referring to the same test you refer to?

A. Well, I have answered it; half an inch.

X Q. 110. Well, did that half-inch take it down to the metal rim?

A. Oh no.

X Q. 111. How much space was there on the tire then, the exposed part of the tire, that didn't go down into the vise?

A. Oh, a quarter of an inch.

X Q. 112. Now, you say you twisted the wheel to see what the effect would be. How did you twist it? State exactly what you did?

A. After the rubber was set in the vise so that it was still free, we had a man bear some weight on the wheel and turn it or twist it so to displace the tire from its normal position.

X Q. 113. Where is your photograph of that?

A. We didn't make one, but we will make you one if you want it.

X Q. 114. Was the wheel perpendicular at the time he twisted it when it sat loosely in the vise?

A. Yes, he stood beside it with his arms over the top of the wheel and held it that way.

XQ. 115. And who twisted the wheel?

A. One of the workmen.

X Q. 116. Where did he take hold of the wheel to twist it?

A. He twisted it by bearing his weight on it, or part of his weight on it; he had his arms over the wheel bearing down on the wheel and twisted it with his body; at the same time he put his weight on it he twisted it.

X Q. 117. This same workman that held the wheel upright did the twisting?

A. Yes.

X Q. 118. And you mean to say, do you, that as that workman leaned on top of that wheel and twisted the wheel, pulled the wires up from the bottom of the channel and the tire out from the bottom of the channel?

A. Yes, he displaced the rubber from the channel of the wheel; in a similar way as shown by the photographs in the exhibit, and he did not have as much weight on the wheel as it could have if it were in actual service.

X Q. 119. How much of the bearing tread of the tire of the wheel is in contact with the pavement in actual travel?

A. It would depend on the rubber compound, a soft compound would have a larger bearing on the ground than a higher compound.

X Q. 120. How much bearing would a soft compound rubber tire have on the pavement?

A. Just as much as the weight of the vehicle will displace the rubber so as to make it flat.

X Q. 121. Well, how much will that be in the ordinary cab of 1,800 or 2,000 pounds?

A. I have already answered that by saying that it would depend on the compound of rubber used.

X Q. 122. Well, take the soft compound and the weight of 2,000 pounds: What would be the tread area of the wheel on the pavement?

A. A soft compound as you describe it doesn't make a specific question to me.

X Q. 123. Well, I tried to use the same expression you used. State the compound you had in mind, or the softer compound of rubber, state what would be the tread area on the pavement of a 2,000 pounds cab?

A. I haven't any specific compound in mind.

X Q. 124. Well, take the ordinary tire, such as the complainants use on a 2,000 pound cab, what will be the area or tread on a pavement?

A. The tread of the tire would be in my judgment under the load you specify and the tire you specify—the rubber would have a bearing on the ground from an inch and a half to two and a half inches.

X Q. 125. What would make the difference between an inch and a half and two and a half inches.

A. The height of the wheel.

X Q. 126. In actual travel this tread is constantly shifting and instantly shifting, is it not?

A. Yes.

X Q. 127. When you were jamming that tire out in the vise the tire couldn't shift, could it?

The question is objected to on the ground that it is an attempt to mislead the witness into adopting the word jam as applied to the tilting of the wheel, and as unfair in that respect, as it does not appear that there was any jamming whatever in the experiments.

A. The tire could have been shifted out of the vise had we wished to do so.

X Q. 128. Do you mean to say that ever in actual practice a wheel equipped with one of these rubber tires under any condition of travel stops its revolution and the shifting of its tread base so that a sideways thrust can be put upon the tire at any point, the wheel being still?

A. Yes, in my judgment a wheel might be held momentarily and undoubtedly they are held momentarily and a sufficient length of time to mutilate the tire by a side thrust as I have seen tires come back for repairs which have been mutilated in that way.

X Q. 129. The rubber in these tires in actual travel is never still, is it; it is always constantly moving or flowing and by its resiliency taking up and dispersing the shocks and blows of travel without passing them to the body of the vehicle, isn't this so? And is not that what a rubber tire means and is for?

A. Yes, but it does not entirely absorb the shocks and may be felt in the vehicle.

Defendant's counsel now desires formally to protest against the examination of this witness and has himself cross-examined subject to such protest for the reason that this testimony is taken against the protest of defendant's counsel and without order of Court or permission of Court and wholly outside of any rule or time limitation for the taking of testimony and is manifestly incompetent, as an attempt to contradict the statements of the patent in suit, and if relevant at all would have been relevant only upon the taking of complaintiffs' *prima facie* case, and defendants here give notice that they will move to strike this deposition from the trial and that if such motion is denied will ask leave of the Court to take testimony showing the misleading character, *flacy* and unfairness of these so-called tests and their utter irrelevancy to establish any fact of right bearing in this case.

EDMUND S. ROBERTS.

Recess until 1:30 for luncheon.

After Recess.

PHILIP ERNENWEIN, recalled for cross-examination:

Cross-examination by Mr. OFFIELD:

Defendant's counsel objects to the entire deposition of this witness as taken without right or authority of law and as incompetent, irrelevant and immaterial, and cross-examines subject to such objection.

X Q. 59. Have you ever driven a cab or had personal charge of vehicles in use having rubber tires?

A. No, sir.

X Q. 60. When you put those two tires on the two wheels as a test, as testified in your deposition, was that the first test that you ever made of this character?

A. Yes, of the kind.

X Q. 61. Under whose direction did you make that test?

A. Mr. Stapleton's.

X Q. 62. Have you ever broken any wires in putting on the tires with the machines you have testified about?

A. Yes, sir.

X Q. 63. Was there a defect in these wires?

A. Not that I know of; I hardly think so.

X Q. 64. You put the same tension or strain on both wires in fastening the tire to the rim, do you?

A. Yes, sir, as far as my judgment goes.

X Q. 65. If you didn't put the same equal strain on both wires in fastening the tire to the rim you would ruin the tire, wouldn't you?

A. If the tire weren't put on tight enough service would ruin it.

X Q. 66. How would service ruin it if it wasn't put on tight enough?

A. It would what we call creep around the wheel and wear out the base.

X Q. 67. It is a fatal defect in the tire if it creeps, is it not?

A. Yes, if it is loose enough to creep it isn't properly applied.

X Q. 68. It takes a very powerful straining of the wires so as to clamp the base of the tire down into the channel and on to the channel so that it will not creep, does it not?

A. Yes, sir.

X Q. 69. It is not possible, is it, to form the tire complete and braze the wires together and then jump the tire over into the channel and in this way have the wire so tight as to prevent creeping, is it?

A. Well, that depends; it is a very hard measurement to get.

X Q. 70. But a tire with the wires so loose the tire could be jumped over into the channel would creep, would it not?

A. It is very apt to.

X Q. 71. The force that causes the tire to creep in the channel is a very powerful force, is it not caused by the whole weight of the load and the striking of the tire against obstacles in travel and like the blows of a sledge hammer drives it back or around the channel rim, is that not so?

A. My opinion is that that isn't the exact reason for it. That is not the exact reason for creeping, the blow that you speak of.

X Q. 72. Well, what is the force?

A. The bunching of the rubber ahead of the wheel.

X Q. 73. And does it not require a very powerful force to bunch this rubber up ahead of the wheel?

A. No, sir, not so great.

X Q. 74. Not so great as what?

A. As a great many other strains it gets.

X Q. 75. All the strain that a rubber tire can possibly get in travel is the strain that come- on the exposed portion of the tire outside of the flange, is it not?

A. Oh, no.

X Q. 76. And at the point of contact with the ground?

A. Oh, no, it gets other strains.

X Q. 77. In actual travel?

A. Yes, sir.

X Q. 78. What are they?

A. Catching in the slot of a car track is one of the great strains.

X Q. 79. Yes, but this is only at the point of contact with the car track, is it not?

A. Yes, that's right.

X Q. 80. Well, the car track is nothing unusual as to its operation with or connection with a rubber tire until the driver attempts to turn out of the track, is it?

A. Unless the groove be so narrow that it bind the rubber and grind it away. Also have more or less strain on the fastening parts which it wouldn't get if it rolled along on a smooth surface.

X Q. 81. As I understand you, you have testified that when these tires are locked into position as tightly as they can be seated by drawing the wires as tightly as they can be drawn without breaking, that such tires in use will tip sideways in their channel, and that you yourself have so seen them tip in going around a curve, and to the extent that you can see under the corner of the base of the tire above the flange of the channel, is that correct?

A. I did see that in one instance, yes, sir.

X Q. 82. Well, if you saw it in one instance you could see it in a thousand if you had been looking at it?

A. If it happened the same, I certainly would have seen it, yes.

X Q. 83. What kind of a curve is this that you can see this wire and tire tip sideways so that you can see under the corner of the base of the tire?

A. In going around the corner of a street, 58th Street and Eighth Avenue; to my best recollection that's the street, when I noticed it I didn't expect to be called on to say anything about it.

X Q. 84. The vehicle was simply going around the corner in the ordinary way when you saw it, was it?

A. Not ordinary; the day was damp, the streets were wet, also the vehicle slewed, which caused the tire to skid.

X Q. 85. That is a very common occurrence and happens millions of times a year in the city, does it not?

A. Undoubtedly.

X Q. 86. Were you told just what kind of experiments or tests or so-called tests to make beforehand, as you described in your testimony?

A. No, sir. How long beforehand do you mean?

X Q. 87. Before you made the test?

A. I was told just possibly an hour before, maybe not as long as that.

X Q. 88. It is your opinion, is it, that a tire will tip more sideways in its channel in travel when the vehicle is heavily loaded than when there is no load on it whatever?

A. It will tip more; the more the load the more it will tip under certain conditions and positions it is in.

X Q. 89. Rubber of different kinds and qualities forming these tires have all been handled by you, have they not?

A. Yes, sir.

X Q. 90. Can you draw these wires so tightly with your machines as to cut the rubber?

A. No, sir, not with our machine, or with any other machines that tires are applied with that I have ever seen.

X Q. 91. No matter what is the quality of the rubber?

A. Any quality that is used for rubber tires.

X Q. 92. Do you put on the side wire tires?

A. Yes, sir.

X Q. 93. In considerable quantities?

A. Not so great at present.

X Q. 94. Do these side wire tires in your opinion rise and fall under the same circumstances as the two internal wires you have been talking about?

A. I think not.

X Q. 95. Have you ever made any other tests except those described in your deposition to determine whether in a vise or otherwise the two internal wires can be made to rise and unseat the bottom of the tire by such lifting and tortion strains described in your deposition?

A. Yes.

X Q. 96. Who did you make these tests for?

A. Why, for myself particularly.

X Q. 97. You would not believe it until you saw it yourself and made some test to satisfy yourself?

A. I would believe it without testing.

X Q. 98. Well, what did you test it for if you believed it?

A. My own satisfaction.

X Q. 99. What kind of test did you make to satisfy yourself that these wires and the base of the tire could be made to rise or fall under any condition of travel?

A. With a tool called the screw driver, a strong screw driver.

X Q. 100. And you would cut away the flange or a portion of the side rim of the channel and get your screw driver under the bottom of the tire and lift, would you?

A. No, sir, I wouldn't take away any of the flange.

X Q. 101. But would just put your screw driver down under the base of the tire?

A. Slipped it along between the rubber and the flange to get under the wire.

X Q. 102. And then make a direct leverage and lift on the end of the screw driver?

A. Yes, sir.

X Q. 103. In actual use the only kind of force that can be applied to a rubber tire to move it as to its base out the channel bed is a force applied to the exposed portion of the tires on one side or the other of the tire, is it not?

A. Yes, or both sides.

X Q. 104. The more a tire becomes worn or the more completely the rubber tire becomes flattened by the weight of the load, the more difficult the opportunity to use lateral thrust or force on the side, is there not?

A. That would depend how the tire was caught in an obstruction.

X Q. 105. Well, if a tire was worn down or flattened so there was but a quarter or an eighth of an inch of the tire exposed above the flange or rim, there would be substantially no opportunity for any kind of a side thrust on this small exposure of the tire to disturb the base, isn't this so?

A. That is true, if there was nothing there to catch on, it couldn't move.

X Q. 106. The very shape of the tire, the smoothness of the car track and especially in any kind of wet weather makes it certain that the tire would slide up and have no other movement than a sliding movement? I mean lift up or slide up when brought in contact with the car tracks or any other obstacle?

A. It would raise the outside corner of the rubber, pulling out of the slot, with any weight whatever.

X Q. 107. Quite certain of that, aren't you?

A. Yes, sir.

X Q. 108. What would — the necessity of the tire moving at all if the car tracks were worn smooth, the tire itself on an angle and all that would be necessary would be for it to slide up. Why would it move from its base under these conditions?

A. The slot is straight; to get the rubber out of the slot it must be turned to a certain angle, that would depend on how short the vehicle was turned. That is why it would raise on the rubber, why it would grip on the side of the rubber.

X Q. 109. Did you ever see this done yourself, personally?

A. Yes, I have seen it turn out of car tracks; any one has, I suppose.

X Q. 110. And you have seen the rubber tire when it turned out of a car track lift up, have you?

A. No, I didn't say that.

X Q. 111. And you never did see any rubber tire lift up and reseat itself in going out of a car track?

A. No, I did not.

X Q. 112. And with the single instance of seeing a cab going around a curve as you have described you have never seen a rubber tire rise from its base and then go back again except when you pried it up by a lever or put it in a vise and gone through the performance that you have shown in your deposition, is this correct?

A. I have seen them raise up the corner other ways besides prying them up or putting them in a vise and raising up the corner.

X Q. 113. Well, tell us about it?

A. Going up against a curb.

X Q. 114. You mean the curb on the side of a street?

A. Yes, sir.

X Q. 115. Where did you see that?

A. In 47th Street.

X Q. 116. And what other street?

A. Not any that I remember.

X Q. 117. Whereabouts on 47th Street?

A. In front of Brewster's carriage factory—side of Brewster's carriage factory on 47th Street.

X Q. 118. What was the wheel doing, trying to get up on the sidewalk?

A. Ran in against the curb.

X Q. 119. How high was the curb?

A. Oh, about five or six inches.

X Q. 120. How could a rubber tire get against a curb five or six inches high without the wheel trying to get up on the sidewalk?

A. It might try to get up on the sidewalk, but it didn't get up there.

X Q. 121. You know perfectly well that in a curb of that height the iron flange or the rim would first strike the curb, unless the driver had attempted to drive directly up onto the sidewalk?

A. Well, the rubber would hit first. I don't know where the driver attempted to drive.

X Q. 122. How many times have you seen this done?

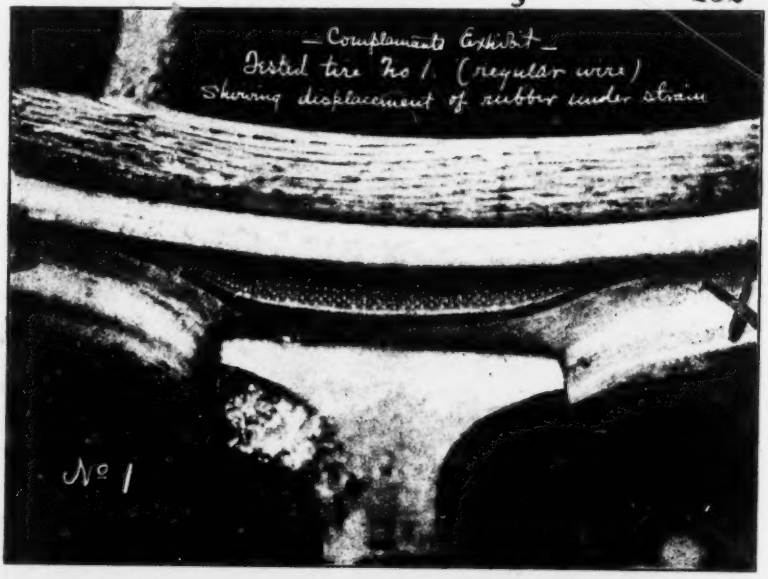
A. Only once.

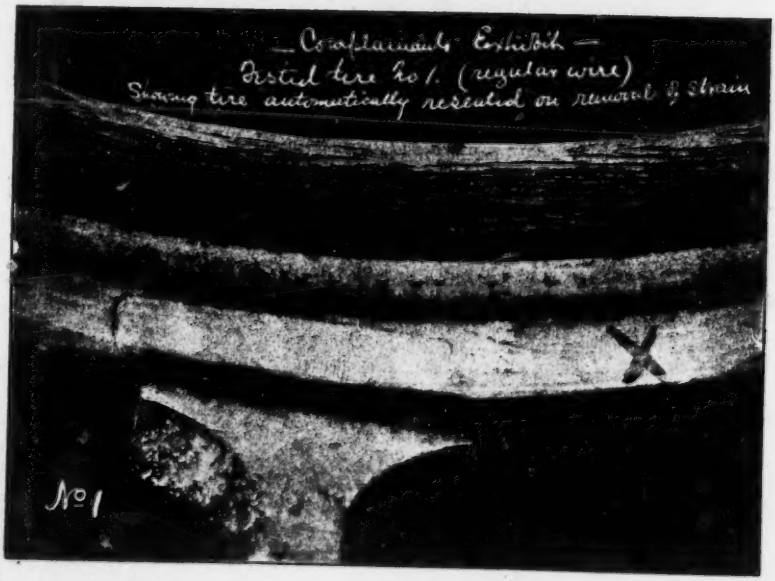
X Q. 123. And what happened then did you say?

A. You could see the rubber of the tire move up from the base.

X Q. 124. How could you see the tire move up from the base; where were you standing?

A. Right in front of it.


—Complainant's Exhibit—
Jostad tire No 1. (regular wire)
Showing displacement of rubber under strain
No 1


—Complainant's Exhibit—
Jostad tire No 1. (regular wire)
Showing tire automatically restored on removal of strain
No 1

Diamond Rubber Co. v. Ore. Rubber Co. } P. 133.

— Complainant's Exhibit —
Goodrich tire No. 2. (hard wire)
Showing displacement of rubber under strain

No. 2.

— Complainant's Exhibit —
Goodrich tire No 2. (hard wire)
Showing tire automatically relieved on removal of strain

No 2

X Q. 125. On the sidewalk or in the street?

A. On the sidewalk.

X Q. 126. And with the rubber of the tire six inches down at the base of the curb you saw the rubber rise up from the base, did you?

A. So you could see it move from the base, yes. The rubber struck the curb six inches up, it might have been five, it might have been eight, but I say about six inches.

X Q. 127. What year did this all happen? That single instance in front of Brewster?

A. This year; the other one I think is seven years ago.

X Q. 128. You do not know but what as to that single instance of seven years ago on 58th Street and Eighth Avenue when you saw a tire rise and fall at its base and this year when you think you saw the same thing in front of Brewster's that both of these tires had been made and the wires brazed and the tires jumped on the wheels, do you?

A. I am positive they were not jumped over the wheel.

X Q. 129. Well, what after seven or eight years makes you positive as to that?

A. That method had gone out of commission before that time.

X Q. 130. How do you know that this method had gone out of use at that time?

A. Well, I know this, that the American Rubber Tire Company did away with it before that and the Rubber Tire Wheel Company did away with it before they did; that's what I know about it.

X Q. 131. But in the early beginning of putting on these Grant tires it was the universal custom to fasten the ends of the wires and complete the tire before jumping them over the rim, was is not?

A. Yes, sir; to my knowledge that is the first way of applying them at the start.

X Q. 132. In these two tires that you thought you saw jump out of the seat, one on 58th Street about seven years ago, and the other by Brewster's in this city this year, you don't know in both of those instances but that the workman in putting on the tires had not drawn the wires as tightly as they did originally by jumping on the tires.

A. Really have no way of knowing that.

PHILIP ERNENWEIN.

Complainant now offers in evidence the vise and bench which were used in making the tests which the witnesses Ernenwein and Roberts have described.

Received and marked Complainant's Exhibit Device Used in Making Complainant's Tests on Tested Wheels, Nos. 1 and 2.

Objected to as incompetent, immaterial and irrelevant.

Proofs are now closed, and complainant's counsel advises defendant's counsel that an application will be made at once to put this cause upon the preferred calendar of the Court for argument.

(Here follow photographs marked pp. 132 & 133.)

UNITED STATES PATENT OFFICE.

ARTHUR W. GRANT, of Springfield, Ohio.

Rubber-tired Wheel.

Specification forming part of Letters Patent No. 554,675, dated February 18, 1896.

Application filed November 14, 1895. Serial No. 568,923. (No model.)

To all whom it may concern:

Be it known that I, Arthur W. Grant, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Rubber-Tired Wheels, of which the following is a specification.

My invention relates to improvements in rubber-tired wheels, and it especially relates to wheels designed for use on ordinary vehicles, such as wagons, buggies, and carriages.

My invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims.

(Here follows diagram marked p. 134.)

In the accompanying drawings, Figure 1 is a side elevation of a wheel embodying my invention. Fig. 2 is a sectional elevation of the wheel-rim, shown partly in perspective. Fig. 3 is a partial longitudinal section through the tire, showing the openings for the retaining-wires. Fig. 4 is a transverse sectional view of the rubber tire in detail.

Like parts are represented by similar letters of reference in the several views.

In constructing my improved rubber tire, I take an ordinary vehicle-wheel, preferably with a plain wooden felly *a*, and to this wooden felly *a* I secure a metallic rim *b*, having at its edges outwardly-projecting flanges *b'*. These flanges *b'* extend outwardly from the rim *b* at an angle, so as to form a groove or channel having tapered or beveled sides, with the bottom of said groove or channel smaller in cross-section than the top. In this groove or channel I place a rubber tire *c*, which is of peculiar shape. This rubber tire is formed preferably of a single piece, but not continuous. It is provided throughout its length with openings *c' c'*, through which are passed retaining-wires *d*. These retaining-wires are separate and independent and extend entirely through the openings *c'*, and the

134 No. 477. Pneumatic Rubber Tire p. 134
Com. Rubber Tire C Mat.

(No Model.)

A. W. GRANT.

RUBBER TIRED WHEEL.

No. 554,675. Patented Feb. 18, 1896.

Fig. 1.

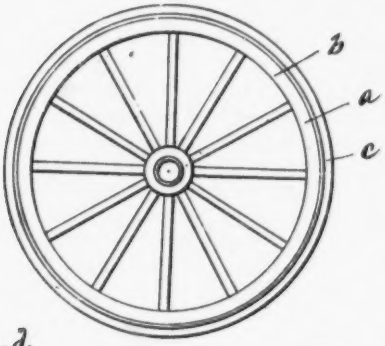


Fig. 2.

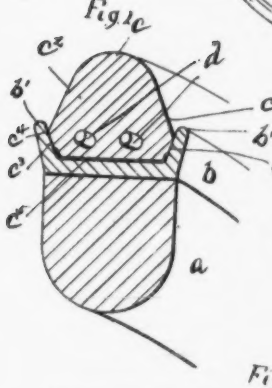


Fig. 4.

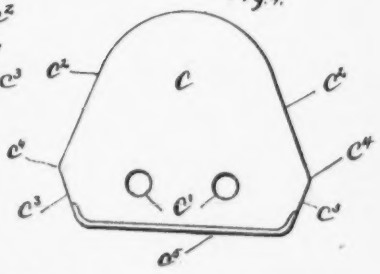
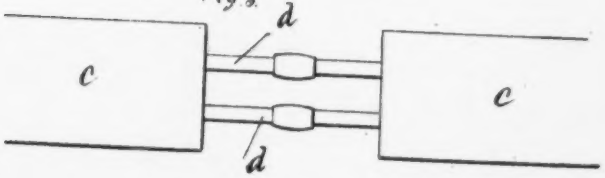


Fig. 3.



Witnesses
Chas. F. Wolcott
F. L. Walker

Inventor
Arthur W. Grant
By his Attorney
Chas. F. Wolcott

ends of each of said retaining-wires are united together after the rubber has been compressed endwise on said wires, thus forming two independent and continuous retaining-wires within the rubber tire, the ends of which, by reason of the compression, are brought together so as to entirely cover the wires and the united ends thereof.

The tire proper, c, is formed of substantially the same depth as width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of the rim, the exposed sides of the tire being formed preferably on the lines c^2 at an angle to each other and also to the flanges b' of the wheel-rim. The unexposed portion of the tire, or that portion which is inclosed within the rim, is formed of substantialy the same shape as the inner channel of the rim—that is to say, it is tapered from the outside inwardly—so that the sides of the inner or unexposed portion of the tire are also formed on the lines c^3, forming with the lines c^2 an obtuse angle. The lines c^3, however, are less in length than the inside of the flanges b', so that the angle or corner c^4 between the sides c^2 and c^3 falls below the outer periphery of the flange b' and within the channel between said flanges. The openings c' through which the retaining-wires pass are also formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b'.

The bottom portion of the tire is reinforced with a canvas strip c^5, which covers the entire bottom and may project slightly along the sides c^3, but does not in any case extend up as far as the angle or corner c^4.

The tire has been described thus minutely because the constructions described are important. By having the sides of the exposed and unexposed portion of the tire formed inclined and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the openings c'. The reinforcing of the bottom of the tire by the canvas strip, which may be formed into the rubber, is desirable, as it has a tendency to prevent the breaking of the rubber below that portion of the tire which is between the retaining-wires and the rim. At the same time, by having the canvas strip wholly within the rim, all danger of stripping the edge of the canvas from the rubber, which would eventually result in a fracture of the rubber to the opening c' is prevented.

It has been found in practice that by the constructions above described I produce a rubber-tired wheel-rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market.

Having thus described my invention, I claim—

1. A vehicle-wheel having a metallic rim with angularly-projecting flanges to form a channel or groove with tapered or inclined

sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining-wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

2. A vehicle-wheel having a metallic rim with outwardly-projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining-wires in said openings, and a reinforcing-strip of fibrous material placed at the bottom of said tire and wholly within said flanges, substantially as specified.

In testimony whereof I have hereunto set my hand this 7th day of November, A. D. 1895.

ARTHUR W. GRANT.

Witnesses:
W. S. HUFFMAN.
E. P. CHRISTIE.

253

Answer.

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK.

Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, *Complainants,*	In Equity.
vs.	No. 186.
Diamond Rubber Company of New York, *Defendant.*	

254 The answer of the Diamond Rubber Company of New York, defendant, to the bill of complaint of the Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, complainants.

This defendant, now and at all times hereafter saving and reserving unto itself all and all manner of benefit of exception that may be had or taken to the many errors, uncertainties and other imperfections in said bill of complaint contained, for answer thereto, or to so much and such parts thereof as this defendant for it to make answer unto, answering says:

255 1. This defendant says it has no knowledge, save from the bill of complaint, whether the Consolidated Rubber Tire Company, complainant, is a corporation organized and existing under the laws of the State of New Jersey, as alleged in the bill, and calls for proof thereof; and further, the defendant says that it has no information, save from the said bill of complaint, whether the complainant, The Rubber Tire Wheel Company, is a corporation organized and existing under the laws of the State of Ohio, as alleged in said bill, but defendant alleges that said The Rubber Tire Wheel Company is not now and has not been for years a valid or existing corporation, and calls

256 for proof as to the allegation in that regard in the bill of complaint,

2. Defendant admits that it is a corporation organized and existing under the laws of the State of West Virginia, and states that its principal office, factory and place of business is at Akron, in the State of Ohio.

3. Defendant admits that letters patent of the United States No. 554,675 were issued to one Arthur W. Grant on the 18th day of February, 1896, for rubber tired wheels, but defendant denies that the said Arthur W. Grant was the true, original and first inventor of the devices and combinations of devices therein shown and de-
257 scribed, and further denies that the same had not been patented or described in printed publications in this and foreign countries; that the same were not known and used by others before the alleged invention of the said Arthur W. Grant, and that the same have not been in public use and on sale in this country for more than two years prior to the date of the application for said letters patent No. 554,675.

4. Defendant, further answering, says that it has no information, save from the said bill of complaint, concerning the application for said letters patent or the regu-
258 larity of the issuance thereof, and calls the complainants for proof.

5. Defendant, further answering, says that it has no knowledge, save from the said bill of complaint, as to the assignment of the said Arthur W. Grant to The Rubber Tire Wheel Company alleged in the bill of complaint to have been made on the 7th day of November, 1895, and recorded in the Patent Office on the 6th day of February, 1896, nor as to what title, if any, was acquired thereby, and calls for strict proof of complainants' title to maintain this suit.

6. Defendant, further answering, denies that the al-

leged invention and improvements of the said letters patent have hitherto been in the exclusive possession of the said patentee or his assignees, but on the contrary defendant alleges that neither said patentee nor his assignees have had at any time exclusive possession of said alleged improvements. 259

7. Defendant further denies that said alleged improvements have been largely introduced into public use by the complainants, but on the contrary defendant alleges the fact to be that the same were in general and public use prior to the granting of the said letters patent, and prior to any introduction of rubber tired wheels upon the market by the complainants. 260

8. Defendant states that it does not know to what extent the complainants or either of them have granted licenses under the said letters patent, but defendant avers that the licenses as granted by the complainants were the result of litigation begun and threatened by the complainants against manufacturers of rubber tires, and that in many instances said licenses were the result of trade agreements and that none of said licenses were granted or accepted in good faith or on account of any belief on the part of the licensees that the said letters patent were good and valid; defendant denies that the public has to any extent acquiesced in the validity of the said patent, and that the complainant would be in the undisturbed possession or enjoyment of any privileges secured by said letters patent, save for the acts of this defendant. 261

9. Defendant, further answering, says that it has no knowledge or information save from the said bill of complaint, as to what interests, if any, the complainant the Consolidated Rubber Tire Company has acquired by virtue of the acquirement of shares of stock of the complainant The Rubber Tire Wheel Company, but defendant denies that by reason of said stock jobbing transaction

262 the complainants the Consolidated Rubber Tire Company acquired any right, title or interest in, to and under said letters patent, or any right to maintain this suit, and defendant therefore denies that the complainants have any joint right, title or interest in the said letters patent, or that either of them have any right or title to maintain this suit.

10. This defendant, further answering, denies that the complainants have marked rubber tires made and sold by them in alleged accordance with the said letters patent, "Patented," with the date of said letters patent as required by law.

263 11. Defendant, further answering, denies that it is in any way or manner infringing upon any rights of the complainants in respect to the said letters patent No. 554,675 or that it is now so doing or intends or threatens so to do or that any of its acts or doings have caused damage to the complainants or resulted in the acquirement of any profits to the defendant which should be accounted for and paid over to the complainants.

12. Defendant, further answering as to the litigation in the relation to said Grant patent, says that as to the suit of *The Rubber Tire Wheel Company* v. *Loubiere*, in

264 the Court of Appeals of Paris, said suit was not and could not have been brought under said Grant patent No. 554,675, and that any judgment or decree in said suit is of effect or force in the court of this country; that as to the suits of *The Rubber Tire Wheel Company* v. *Columbia Pneumatic Wagon Wheel Company* in this court, the defendant is not fully advised as to whether the same was a contested suit, nor what effect, if any, may be given by this court to any such decision as may have been rendered therein; that as to the case of *The Rubber Tire Wheel Company* v. *Finley Rubber Tire Company*, in the United States Circuit Court of the District of Georgia, said suit

was never tried upon its merits upon final hearing, and 265
that the validity of said patent No. 554,675 was neither called in question nor determined in said suit or proceeding; that as to the suit of *The Rubber Tire Wheel Company et al.* v. *Goodyear Tire & Rubber Company* begun in the United States Circuit Court for the Northern District of Ohio, it appears from the said bill of complaint that upon appeal to the United States Circuit Court of Appeals for the Sixth Circuit, said Grant patent No. 554,675 was declared invalid and void, and defendant says that as appears from the decision of this court, reported in 116 F. R., beginning on page 363, said court 266
did not allege in the bill of complaint, base its decision on premises untenable in fact, but that said decision is amply supported by the facts and is in all respects right. And the defendant says that said last mentioned decision was rendered subsequent to and with full knowledge of the other decisions referred to in the bill of complaint, and that by reason thereof the said Grant stands today as an invalid patent; that the complainants herein, seeking to question and overturn said decision and finding petitioned the Supreme Court of the United States for a writ of certiorari to the Circuit Court of Appeals for the Sixth Circuit to require said court to send up the record and 267
proceedings in said suit for the consideration and determination of that court, but that the Supreme Court denied said petition, thereby leaving the invalidity of the said Grant patent judicially established.

13. This defendant, further answering, says that the combination of devices attempted to be protected by said letters patent was in all essential respect a matter of common knowledge in this country long before the alleged invention or disclosure thereof by the said Arthur W. Grant; that the complainants nor either of them have ever manufactured, used or sold rubber tires or rubber tired

268 wheels containing the combination of devices set forth in said Grant patent, and that the combination intended to be covered by said claims is not a patentable combination or the result of invention, but at the most the result of mechanical skill.

14. This defendant, further answering, says that the patentee of said letters patent has admitted under oath that the mechanical combinations and arrangements disclosed by the said letters patent in suit were the result of mere mechanical changes developed by defects in the use of rubber tires, and that the remedy therefor was apparent to any ordinary mechanic watching the operation
269 of such tires.

15. This defendant, further answering, avers that the alleged inventions, combinations and devices described and claimed in said letters patent in suit and identified by the bill of complaint herein, and long prior to the alleged invention or discovery thereof by said Grant, had been described, shown and patented in the following letters patent of the United States:

No. 11,446, August 1, 1854, George Souther.
No. 84,878, December 15, 1868, J. A. Greene.
No. 86,504, February 2, 1869, John H. Cheever.
270 No. 86,709, February 9, 1869, C. S. Stearns.
No. 91,435, June 15, 1869, J. A. Greene.
No. 179,253, June 27, 1876, W. H. Bailey.
No. 192,005, June 19, 1877, C. P. Clark.
No. 193,988, August 7, 1877, Francis Mulliner.
No. 235,552, December 14, 1880, Thomas W. Moran.
No. 252,624, January 24, 1882, J. E. Richards.
No. 264,133, September 12, 1882, James O. Brown.
No. 294,461, March 4, 1884, P. Gendron.
No. 315,537, April 14, 1885, A. H. Overman.
No. 321,819, July 7, 1885, W. S. Kelly.
No. 339,422, April 6, 1885, James Hudson.

No. 339,550, April 6, 1886, James Hudson. 271
No. 341,811, May 11, 1886, Emmit G. Latta.
No. 345,351, July 13, 1886, L. F. Whiton.
No. 348,692, September 7, 1886, David H. Rice.
No. 353,071, November 23, 1886, H. A. King.
No. 357,819, February 15, 1887, C. E. Duryea.
No. 358,291, February 22, 1887, Edward C. F. Otto.
No. 362,472, May 3, 1887, Thos. Warwick.
No. 362,514, May 10, 1887, W. S. Kelly.
No. 364,989, June 14, 1887, Wm. H. Cartmont.
No. 365,091, June 21, 1887, Frederick H. Owen.
No. 371,580, October 18, 1887, Frank H. Harris.
No. 383,129, May 22, 1888, Thos. B. Jeffrey. 272
No. 390,977, October 9, 1888, Camilli Kramer.
No. 399,360, March 12, 1889, Amos W. Thomas.
No. 399,453, March 12, 1889, George T. Warwick.
No. 404,692, June 4, 1889, Rudolph W. Donmoyer.
No. 411,791, October 1, 1889, H. M. DuBois.
No. 412,699, October 8, 1889, H. M. DuBois.
No. 418,982, January 7, 1890, F. E. Lyon.
No. 419,005, January 7, 1890, H. M. DuBois.
No. 420,609, February 4, 1890, Southard & Klauser.
No. 420,610, February 4, 1890, Southard & Klauser.
No. 422,349, February 25, 1890, E. Francis Eldredge. 273
No. 424,084, March 25, 1890, Howard Unwin.
No. 424,452, April 1, 1890, P. J. Beiersmith.
No. 424,766, April 1, 1890, H. M. DuBois.
No. 431,233, July 1, 1890, Albert Claypool.
No. 431,512, July 1, 1890, H. M. DuBois.
No. 434,974, August 26, 1890, W. E. Bartlett.
No. 436,993, September 23, 1890, A. H. Overman.
No. 437,447, September 30, 1890, Overman Wheel Co.
No. 438,383, October 14, 1890, Overman Wheel Co.
No. 440,701, November 18, 1890, Sterling Elliott.
No. 440,702, November 18, 1890, Sterling Elliott.

274 No. 442,730, December 16, 1890, Elliott & Richards.
No. 443,735, December 30, 1890, Overman Wheel Co.
No. 448,793, March 21, 1891, W. E. Bartlett.
No. 449,502, March 21, 1891, A. Straus.
No. 20,678, Design Patent, April 14, 1891, C. Coops.
No. 450,816, April 21, 1891, A. H. Overman.
No. 452,001, May 12, 1891, Nicholas Yagn.
No. 453,520, June 2, 1891, A. Straus.
No. 456,751, July 28, 1891, George Ahlborn.
No. 459,363, September 8, 1891, L. A. Hill.
No. 460,243, September 29, 1891, Thomas Weir.
No. 463,153, November 17, 1891, E. G. Hoffman.
275 No. 464,767, December 8, 1891, C. E. W. Woodward.
No. 466,112, December 29, 1891, John H. Bingham.
No. 11,216, Reissue, December 29, 1891, W. E. Bartlett.
No. 466,548, January 5, 1892, C. E. W. Woodward.
No. 466,577, January 5, 1892, F. Schrader.
No. 467,112, January 12, 1892, F. S. Willoughby and Thomas Horsfield.
No. 467,769, January 26, 1892, Charles Challiner.
No. 468,971, February 16, 1892, Henry Myers.
No. 470,483, March 8, 1892, Grant & Jeffries.
276 No. 470,915, March 15, 1892, Wm. C. McIntire.
No. 473,831, April 26, 1892, John B. Dunlop
No. 481,340, August 23, 1892, C. E. W. Woodward.
No. 482,487, September 13, 1892, L. J. Phelps.
No. 484,786, October 24, 1892, Fane & Lavender.
No. 488,494, December 20, 1892, Brown & Stillman.
No. 489,509, January 10, 1893, Frank Sweetland.
No. 493,650, March 21, 1893, E. F. Ryder.
No. 497,995, May 23, 1893, Frank W. Tucker.
No. 499,574, June 13, 1893, Chas. H. Pagett.
No. 501,992, July 25, 1893, David Crowther.
No. 506,424, October 10, 1893, Alfred Ducasble.

No. 511,850, January 2, 1894, W. Langmuir. 277
No. 527,820, October 23, 1894, John C. Tallman.
No. 529,474, November 20, 1894, Blosser & Kunkle.
No. 539,826, May 28, 1895, James G. Rodgers.
No. 540,478, June 4, 1895, P. Ambjorn Compte De Sparre.
No. 543,434, July 23, 1895, Theo. B. Blosser.

LETTERS PATENT OF GREAT BRITAIN.

No. 4,352, September 11, 1883, Kearsley.
No. 4,926, March 15, 1884, Clark.
No. 9,359, August 5, 1885, Black & Jones.
No. 11,987, September 5, 1887, Beale. 278
No. 11,329, August 4, 1888, Beale.
No. 14,993, September 22, 1889, Brooke.
No. 16,336, November 10, 1888, Connolly.
No. 2,461, February 12, 1889, Wynne.
No. 1,901, February 12, 1890, Hoffman.
No. 3,014, February 25, 1890, Eldredge.
No. 3,705, March 8, 1890, James Hudson.
No. 4,064, March 15, 1890, Willoughby.
No. 6,521, April 29, 1890, Hookham.
No. 8,833, June 7, 1890, Phillipps.
No. 14,812, September 19, 1890, Lenton.
No. 14,563, September 16, 1890, Chas. K. Welch. 279
No. 15,448, September 30, 1890, Jno. Harrington.
No. 16,348, October 14, 1890, Bartlett.
No. 18,321, November 14, 1890, Whiteley.
No. 20,706, December 18, 1890, Timberlake.
No. 4,434, March 12, 1891, Benjamin Oldfield.
No. 12,580, July 24, 1891, Thomas Dale.
No. 12,205, September 8, 1891, Christian.
No. 4,977, March 14, 1892, R. W. Barker.
No. 5,924, March 26, 1892, F. S. Willoughby.
No. 9,006, May 12, 1892, D. Crowther.

280 No. 16,116, September 8, 1892, Walker.
No. 18,030, October 10, 1892, F. S. Willoughby.
No. 23,451, December 20, 1892, Henry Menier.
No. 21,341, November 9, 1893, A. Hutchinson & Co.
No. 24,962, December 28, 1893, Leo Ohnstein.

LETTERS PATENT OF SWITZERLAND.

No. 8,120, February 17, 1894, Joseph Everett.

16. This defendant, further answering, avers that the alleged inventions, combinations and devices described and shown in the letters patent set forth in the bill of
281 complaint herein, had long prior to the date of the alleged invention or discovery thereof by said Grant been described and shown in certain printed publications as follows:

The printed publication known as or entitled "Elliot Elliotts's Ould Hickory Almanac," printed and published by Elliott Hickory Cycle Company at Newton in the State of Massachusetts, in January, 1892, particular reference being had to the page between the calendars for September and October, 1892, therein.

The printed publication known as and entitled "India Rubber World and Electrical Trades Review," printed
282 and published by The India Rubber Publishing Company, in the City of New York, in the State of New York, July 10, 1895, particular reference being had to the text and illustrations of an article entitled "Carriage Wheel Tires in England," on page 295 thereof.

17. This defendant, further answering, avers the fact to be that long before the date of the alleged invention of said Grant of the alleged improvements shown and described in the letters patent declared upon the bill of complaint herein, and all material and substantial parts thereof alleged or claimed as new in said patent, were

publicly known and used in this country for more than two years prior to the date of application of said Grant for said patent, by the following named parties at the following named places: 283

Sterling Elliott at Newton, in the State of Massachusetts and elsewhere in the United States, who now resides at said Newton.

Charles E. Walker and George H. Day, each of said Newton, in the State of Massachusetts, and at the City of Hartford in the State of Connecticut, each of whom is now residing in said City of Hartford.

Elliott Hickory Cycle Company and Hickory Wheel Company, each at said Newton, in the State of Massachusetts, each of whom is now located at the City of Hartford, in the State of Connecticut. 284

Hartford Rubber Works Company, at the City of Hartford, in the State of Connecticut, which is now located in the said City of Hartford.

A. H. Overman at Chicopee Falls, in the State of Massachusetts, who now resides in the City of Springfield, in the State of Massachusetts.

Theodore B. Blosser, at the City of Springfield, in the State of Ohio, who now resides at said City of Springfield.

Howard B. DuBois, at the City of Philadelphia, Pa., in the City of Philadelphia, Pa. 285

The Victor Rubber Tire Company, at said City of Springfield, in the State of Ohio, which is now located in said City of Springfield.

The Columbia Pneumatic Wagon Wheel Company, at the City of New York, in the State of New York, which is now located in said City of New York.

The Rubber Tire Wheel Company at said City of Springfield, in the State of Ohio, which is now located at said City of Springfield.

286 E. S. Kelly, at said City of Springfield, in the State of Ohio, who now resides in said City of Springfield.

T. B. Jeffrey, at the City of Chicago, in the State of Illinois, who now resides in said City of Chicago.

18. This defendant, further answering, avers that the said patentee, Arthur W. Grant, by the proceedings had and taken by him in the Patent Office, in connection with the obtainment of said letters patent and the modifications, admissions and disclaimers therein made by him, for the obtainment of said letters patent, has himself admitted that his alleged invention consists of nothing other or different than the precise mechanical detail of
287 construction exhibited by his patent and has made it certain as a matter of fact in view of the patents above cited and not present or before the Patent Office that the combinations and devices do not disclose patentable novelty and invention and that the Patent Office would have so found had such letters patent herein set forth been present and considered by the Office antecedent to the granting of the patent, all of which matters and things appear by reference to the file-wrapper and contents of the application for said letters patent in suit, or a duly certified copy thereof to be hereafter produced in support of this alle-
288 gation.

19. This defendant, further answering, avers that the specifications and drawings constituting said letters patent herein sued upon, do not distinctly point out, identify and claim the asserted inventions therein sought to be protected so that a person skilled in the industry to which this patent relates could understand and construct the same; this defendant averring that said patent is craftily drawn for the purpose of deceiving the public and of permitting the complainant corporations herein to make wide, general sweeping claims against competitors in business under said letters patent and embarrass the

ordinary free course of trade in the industry to which 289
this patent relates by so doing.

20. This defendant, further answering, denies that it has been notified in any legal or lawful manner, whatever prior to the filing of the bill of complaint herein of the letters patent relied upon in said bill of complaint or of the claims of the complainants as against this defendant thereunder.

21. This defendant, further answering, admits that said Grant patent has been sustained upon the final hearing, both at the Circuit and in the United States Circuit Court of Appeals, for the Second Circuit, as alleged in Section 8 and in complainants' bill of complaint; but de- 290
fendant avers that said suit was prepared and tried upon the part of the defendant herein with the expectation and intention to petition the Supreme Court of the United States for a writ of certiorari to remove said case to said Supreme Court if decision was adverse to said defendant as it was, as stated in clause 8 of the complainants' bill of complaint; this defendant averring that the said case was settled between the parties litigant and that no certiorari petition was filed by defendant; defendant further averring that said case was settled by the parties litigant to especially prevent the filing of said petition and that the 291
defeated defendant therein paid no sum of money whatever upon such settlement to complainant or other consideration not even the taxable costs and that the said complainant paid the defendant in that case a very large sum of money or other consideration to prevent the filing of a certiorari petition.

22. This defendant, further answering, avers that said complainant is without standing in this or any court of equity, because said complainant has used and is now using the decision of this case, identified by clause 8 of complainants' bill of complaint and the Grant patent iden-

292 tified by said decision for an unlawful purpose to create thereby an unlawful monopoly and to stifle competition and fix exorbitant prices for rubber tires to be paid by the purchasing and using public and to evade the Sherman Act, and to fix and maintain prices on rubber tires having no relation to, or covered by said Grant patent; that the complainant is part of said unlawful monopoly and conspiracy and has entered into an agreement with other manufacturers of rubber tires. A printed copy of said agreement appearing as an exhibit in this case, attached to the affidavit of defendant's secretary, Mr. Harvey T. Woodard and filed herein upon complainants' in-
293 junction motion presented. This defendant avers that without doubt and without any manner or question this defendant will file a petition for a writ of certiorari in the Supreme Court founded on facts disclosed by the record as here made, if the case is decided adversely to this defendant in this Circuit Court of Appeals.

All of which matters and defenses this defendant is ready and willing to aver, maintain and prove, as this Honorable Court shall direct, and if there be any matter, cause or thing alleged or charged in said bill of complaint which is not herein and hereby well and sufficiently
294 answered or confessed and avoided, this defendant says that the same is not true, and prays to be hence dismissed with reasonable costs and charges in this behalf most wrongfully sustained.

THE DIAMOND RUBBER CO. OF N. Y.,
HARVEY J. WOODARD, Sec.

JOHN W. INGRAM,
PHILIP B. ADAMS,
Solr's for Defendants,
21 Park Row, N. Y.
CHARLES K. OFFIELD,
Of Counsel.

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UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, *Complainants.*
vs.
Diamond Rubber Company of New York, *Defendant.*
} In Equity.

NOTICE.

296 Please take notice that on Thursday, December 5, 1907, at 11 o'clock A. M., at the office of Offield, Towle & Linthicum, 1228 Monadnock Building, Chicago, Illinois, before Frederick C. Goodwin, notary public, we shall proceed to take the testimony of Samuel N. Pond, and others, such witnesses residing more than one hundred miles from the Southern District of New York, in behalf of defendant in the above-entitled cause, such testimony to be adjourned from day to day until completed.

You are invited to attend and cross-examine, if you so desire.

OFFIELD, TOWLE & LINTHICUM,
297 Solicitors for Defendant.

Service of the above notice acknowledged and accepted this.....day of December, 1907.

.....

298 UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, *Complainants,*
vs.
Diamond Rubber Company of New York, *Defendant.*
} In Equity.

At the City of Chicago, in the County of Cook and State of Illinois, at Room 1228 Monadnock Building, in
299 said city, on the 5th day of December, 1907, before me, Frederick C. Goodwin, a notary public, at 11 o'clock in the forenoon of said date, personally appeared Mr. Charles K. Offield, in behalf of defendant, and Mr. Paul A. Staley, in behalf of complainants, pursuant to notice hereto attached, and thereupon the following testimony was taken, by agreement of counsel.

It is hereby agreed by and between counsel attending, in behalf of both parties litigant, as follows:

1. Patent Office copies of letters patent, United States and foreign, in the usual printed form, may be offered in evidence, and used with the same force and effect, and so
300 stand as the originals thereof, subject to correction of such orginals respectively, if any error there be.

2. That the filing dates appearing upon said printed copies may be taken and stand as the original and correct filing date, subject to correction by comepetent proof, if any error there be.

3. That the exhibits offered in evidence by either party may be retained by the party making the offers respectively, to be produced by either party, with notice to the other, upon the taking of testimony until notified by counsel to file the same in court.

Defendant's counsel requests complainants' counsel to 301
produce upon Monday forenoon, the 9th inst., at 10 o'clock A. M., and have here present as a subject-matter of testimony by and concerning witnesses to be called by the defendant, all of the exhibits offered in evidence upon the taking of complainants' *prima facie* case herein.

Defendant's counsel here offers in evidence the following letters patent, United States and foreign, to be marked as exhibits in this case:

UNITED STATES LETTERS PATENT.

John Ashton Greene, No. 169,100, dated October 26, 302
1875, for Improvements in Rubber Tires for Wheels, and requests that the same be marked "Defendant's Exhibit Greene 1875 Patent."

W. S. Kelley, No. 321,819, dated July 7, 1885, for Improvements in Bicycles and Tricycles, and requests that the same may be marked "Defendant's Exhibit Kelley 1885 Patent."

W. S. Kelley, No. 362,514, dated May 10, 1887, for Improvements in Wheels for Bicycles, and requests that the same may be marked "Defendant's Exhibit Kelley 1887 Patent."

E. G. Latta, No. 341,811, dated May 11, 1886, for Im- 303
provements in Velocipede, and requests that the same may be marked "Defendant's Exhibit Latta 1886 Patent."

F. D. Owen, No. 365,091, dated June 21, 1887, for Improvements in Bicycles, Tricycles, etc., and requests that the same may be marked "Defendant's Exhibit Owen 1887 Patent."

P. J. Beiersmith, No. 424,452, dated April 1, 1890, for Improvements in Methods of Securing Rubber Tires in Metal Wheel-Rims, and requests that the same may be marked "Defendant's Exhibit Beiersmith 1890 Patent."

304 S. Elliott, No. 440,701, dated November 18, 1890, for Improvements in Means for Attaching Rubber Tires, and requests that the same may be marked "Defendant's Exhibit Elliott 1890 Patent."

S. Elliott, No. 440,702, dated November 18, 1890, for Improvements in Means for Attaching Rubber Tires, and requests that the same may be marked "Defendant's Exhibit Elliott No. 440,702 1890 Patent."

C. E. W. Woodward, No. 443,735, dated December 30, 1890, for Improvements in Rims and Rubber Tires for Vehicle Wheels, and requests that the same may be marked "Defendant's Exhibit Woodward 1890 Patent."

305 A. W. Grant & D. P. Jefferies, No. 470,483, dated March 8, 1892, for Improvements in Cores for Rubber Wheel Tires, and requests that the same may be marked "Defendant's Exhibit Grant & Jefferies 1892 Patent."

C. E. W. Woodward, No. 481,340, dated August 23, 1892, for Improvement in Rims and Tires for Vehicle Wheels, and requests that the same may be marked "Defendant's Exhibit Woodward 1892 Patent."

J. G. Rodgers, No. 539,826, dated May 28, 1895, for Improvement in Rubber Tires for Vehicle Wheels, and requests that the same may be marked "Defendnat's Exhibit Rodgers 1896 Patent."

306 J. A. Swinehart, No. 624,992, dated May 16, 1899, for Improvement in Rubber Tires for Vehicles and Means for Retaining the Same, and requests that the same may be marked "Defendant's Exhibit Swinehart 1899 Patent."

C. Coops, No. 20,678, dated April 14, 1891, for Design for India Rubber Tires for Wheels, and requests that the same may be marked "Defendant's Exhibit Coops 1891 Patent."

Frederick Schrader, No. 466,577, dated January 5, 1892, for Improvements in Wheel-Tires, and requests

that the same may be marked "Defendant's Exhibit Schrader 1892 Patent." 307

Pierre Ambjorn Comte De Sparre, No. 540,478, for Improvement in Wheel for Cycles, dated June 4, 1895, and requests that the same may be marked "De Sparre 1895 Patent."

Albert Claypool, No. 431,223, dated July 1, 1890, for Improvement in Rubber Tires for Wheels and Means for Holding the Same in Place, and requests that the same may be marked "Defendant's Exhibit Claypool 1890 Patent."

Henry Myers, No. 468,971, dated February 16, 1892, for Improvements in Wheel-Tires, and requests that the same may be marked "Defendant's Exhibit Myers 1892 Patent." 308

T. B. Blosser & J. P. Kunkle, No. 529,474, dated November 20, 1894, for Improvement in Vehicle Wheels, and requests that the same may be marked "Defendant's Exhibit Blosser & Kunkle 1894 Patent."

FOREIGN PATENTS—BRITISH.

Thomas Dale, No. 12,580, dated July 24, 1891, for Improvements in India Rubber Tyres and Metal Rims of the Wheels of Bicycles, etc., and requests that the same may be marked "Defendant's Exhibit Dale 1891 British Patent." 309

Charles Kingston Welch, No. 14,563, dated September 16, 1890, for Improvements in Rubber Tyres and Metal Rims or Felloes of Wheels for Cycles, etc., and requests that the same may be marked "Defendant's Exhibit Welch British 1890 Patent."

Robert Kearsley, No. 4352, dated September 11, 1883, for Improvements in the India Rubber and Metal Tyres of the Wheels of Carriages, etc., and requests that the same may be marked "Defendant's Exhibit Kearsley 1883 British Patent."

310 James Sidney Lenton, No. 14,812, dated September 19, 1890, for Improvements in or Relating to the Tyres and Rims of Velocipedes and Other Carriages, and requests that the same may be marked "Defendant's Exhibit Lenton 1890 British Patent."

William Timberlake, No. 20,706, dated December 18, 1890, for Improvements in or Appertaining to Cushion Tyres, etc., and requests that the same may be marked "Defendant's Exhibit Timberlake 1890 British Patent."

Frank Stanley Willoughby, No. 5924, dated March 26, 1892, for Improvements Relating to Rubber Tyres for Wheels, and requests that the same may be marked "De-
311 fendant's Exhibit Willoughby 1892 British Patent."

Frank Stanley Willoughby, No. 18,030, dated October 10, 1892, for Improvements in the Tyres of Carriages and Velocipede Wheels, and requests that the same may be marked "Defendant's Exhibit Willoughby 1892 No. 18,030 British Patent."

FOREIGN PATENTS—SWISS.

Joseph-David Everett, No. 8120, dated February 17, 1894. Roue Perfectionee pour Velocipedes et Autres Vehicles, and requests that the same may be marked "De-
312 fendant's Exhibit Everett 1894 Swiss Patent."

Adjournment taken until 10 A. M., Friday, December 6, 1907.

Friday, December 6, 1907. Met pursuant to adjournment. Present, same as before.

Defendant's counsel here offers in evidence certified copy file-wrapper and contents Blosser & Kunkle patent, dated November 20, 1894, and requests that the same may be marked "Defendant's Exhibit File-Wrapper and Contents Blosser & Kunkle Patent."

Defendant's counsel also offers in evidence extract

from publication "The India-Rubber World" of July 10, 1895, printed upon pages 288 and 289, Exhibit Appeal Record Firestone case, and requests that the same may be marked "Defendant's Exhibit Rubber World Article." 313

Defendant's counsel also offers in evidence the following additional United States letters patent:

Letters patent granted Alexander T. Brown and George F. Stillman, dated December 20, 1892, numbered 488,494, and requests that the same may be marked "Defendant's Exhibit Brown & Stillman 1892 patent."

Defendant's counsel here offers in evidence the entire records and exhibits of the several cases identified by the order and decree of Judge Holt entered herein December 2, 1907, as follows: 314

Printed record in the Goodyear case in the Sixth Circuit of this complainant against the Goodyear Tire & Rubber Company, and requests that the same may be marked "Defendant's Exhibit Appeal Record Goodyear Case."

Also entire printed record and exhibits in the Kokomo case, being a case of this complainant against the Kokomo Rubber Company in the Seventh Circuit, and requests that the same may be marked "Defendant's Exhibit Appeal Record Kokomo Case."

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Also entire printed record and exhibits in the Firestone case, being a case of this complainant against the Firestone Tire & Rubber Company in the Second Circuit, and requests that the same may be marked "Defendant's Exhibit Appeal Record Firestone Case."

It is hereby stipulated and agreed between counsel for the respective parties that the depositions and other proofs contained in said records may be used in this case with the same force and effect, as though said various depositions and other proceedings contained in the said records had been duly and regularly taken herein; that

316 the complainant's part of said records may be treated and used as a part of complainant's record herein, and that the defendant's part of said records may be treated and used as a part of defendant's record herein as though the same were proceedings had and depositions taken in this cause; and that the printed copies of the three records offered in evidence herein are the printed records upon which the cases, respectively, were heard and decided.

Thereupon defendant called in their behalf Mr. SAMUEL N. POND, who, being first duly sworn, answers as follows to interrogatories propounded by
317 Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Samuel N. Pond; 41 years; Morgan Park, Illinois; attorney and expert in patent causes.

Q. 2. Are you the same Mr. Pond who gave an affidavit in this same case on the injunction motion?

A. I am.

Q. 3. Please state what experience, education and qualification you have, both practical and theoretical, which qualifies you to study and understand letters patent
318 of the United States and foreign relating to inventions and discoveries and enables you to understand the practical operation of the devices therein described and shown, and what experience you have had which qualifies you, generally, to testify as a witness, concerning inventions and devices, in practical form, and compare the same with descriptions of letters patent or publications, and to thereby point our similarities and differences between the same, and, generally, your experience, if any, as an expert witness upon mechanical propositions in patent causes.

A. As regards my education, I am a graduate of

Philips Academy, Andover, Mass., Yale College, and the 319
Law School of the Columbian University (now the George Washington University) of Washington, D. C. In January, 1890, I entered the service of the Patent Office at Washington, as an assistant Examiner, having obtained my position as the result of civil service examination on scientific subjects. I served for a period of nearly nine years in the Patent Office, during which time I received two promotions to higher grades as a result of competitive examinations on questions of patent law, practice, and Patent Office procedure. Part of this time I was occupied in what is known as the Textile Division, in which I handled the classes of spinning and cordage. 320
The remainder of the time I was occupied in the Division of Pneumatics, in which I examined applications pertaining to the arts of gas engines, air and gas pumps, and pneumatic store service. My principal duties consisted in the examination of applications for patents, submitted in the various arts on which I was engaged; and the examination of a patent application by a Patent Office Examiner requires a careful reading of the specifications, claims and drawings to ascertain the nature and character of the invention, and a thorough search of the prior immediate or related arts to determine whether or not the 321
subject-matter of the claims presented is anticipated; in other words, to ascertain the substantial novelty of the invention submitted. This work is done by the Examiners of the Patent Office almost exclusively from a reading of the drawings of prior patents, at which the Examiners become very expert from daily and long continued practice. Besides ascertaining and passing upon the novelty or otherwise of inventions submitted in the manner above indicated, it was also my duty to pass judgment upon questions relating to the existence of patentable inventions in the many cases where the invention was not found

322 to be completely anticipated, but was more or less closely approximated in the prior art; in other words, to determine whether or not a device or machine submitted evidenced the exercise of invention over prior structures differing but slightly therefrom. One of the most frequent forms of this question arises in cases where an applicant submits a device or machine disclosing no new element, but a new grouping or collocation of old elements, and it is then the Examiner's duty to determine whether or not such assemblage or bringing together of two or more old devices or features from the prior art
323 presents a true and harmonious combination effecting a novel result, or represents simply a mere aggregation of old devices or features effecting no co-operative or combined results. In my work of thus examining and determining the rights of applicants for patents under the law, I was obliged to and did determine many questions of this character. My work as an Examiner not only involved the examination of applications as a test for novelty and invention, but also the comparison of co-pending applications, and the declaration of interferences when such were found to exist by reason of conflicting applications for the same invention, filed by dif-
324 ferent applicants.

In this way, and by this experience, I became familiar with the practice of the United States Patent Office and with the general trend of the views of the Office, as represented by its official head, the Commissioner of Patents, on the questions of patentable novelty and invention, and I acquired, as I believe, some skill in comparing and analyzing structures relating to similar arts, and determining questions of substantial similarity or difference between them.

In November, 1898, I voluntarily resigned my position and moved to Chicago, where I opened an office for the

soliciting of patents and general practice of patent law. 325
This office I maintained for a period of two years, until November, 1900, when I accepted a position with the firm of Offield, Towle & Linthicum, of Chicago, in whose office I have since been continuously occupied in the soliciting of patents, and the general work of a patent law office. Both in my own office and since my connection with the firm above named, I have prepared numerous written opinions on questions relating to the validity, scope and infringement of patents, and I have prepared numerous affidavits for and against motions for preliminary injunctions; and in addition thereto for the past five years a considerable portion of my time has been 326
occupied in the giving of expert depositions in patent suits and in preparation therefor.

Q. 4. Have you studied and examined the letters patent in suit, and marked "Complainants' Exhibit Complainants' Patent," and being the Grant patent of February 18, 1896, and numbered 554,675, so that you understand said patent and the practical construction and operation of the device therein shown and described?

A. I have carefully read and examined the said patent and have long been familiar therewith, and believe that I fully understand the same.

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Q. 5. Have you also read, and carefully studied, the various letters patent exhibits, United States and foreign, offered in evidence by defendant, and present as evidence in this case, and also understand the practical construction and operation of the devices identified by these exhibits in the practical use for which they are intended?

A. I have carefully read the said exhibits, and believe that I fully understand their construction and operation.

Q. 6. Will you now please take up and compare "Complainants' Exhibit Complainants' Patent," being the Grant patent in suit, with these various exhibit patents offered

328 in evidence by defendant, and state how far, to what extent, if at all, you find the inventions, combinations and devices of this Grant patent to be contained in or represented by either exactly or substantially any of the old exhibits of prior patents, and give your reasons plainly and distinctly as to each of these patents for any opinion you may express as to this matter, and in this connection you may take up each of these old patents in your own order and in your own way and compare them with the Grant patent in suit as above indicated without further detail question?

329 Recess.

A. Preliminary to the requested comparison, I will first explain what I understand to be the invention disclosed and covered in and by the Grant patent in suit; and in view of the extended litigation to which this patent has been subject, and of the voluminous records thereon, and in view also of the fact that this patent has quite recently been before this court in the suit of these complainants against the Firestone Tire & Rubber Company, I do not deem it necessary in order to make clear the nature and purpose of the invention of the patent in suit, and its
330 place in the art, to enter into any detailed history of the origin, evolution and development of the rubber tire art. This has already been done in an able and interesting manner by the experts who have preceded me in other litigation on this patent, notably in the deposition of the late Mr. Robert H. Wiles in the Firestone suit, and in the deposition of Mr. James W. See in the Goodyear case, particularly the latter. It will suffice for me to say that the alleged invention of the patent in suit had its birth at a time when rubber tires for vehicles had become a well-established article in the vehicle art, and when the art had progressed from the old and earlier practice of cementing

the rubber tire to the rim of the wheel to the practice of securing the tire to its seat on the rim by mechanical fastenings of various sorts. Furthermore, at the time of the genesis of the alleged invention of the patent in suit, the art antecedent thereto had been developed to a point exhibiting a large variety of forms and shapes of rubber tires, a large variety of forms and shapes of seating devices or rims for such tires, and a large variety of mechanical fastening devices for retaining the tires in their seats under the strains and tests of service, all as will be shown by the prior patents which I shall hereinafter discuss somewhat in detail. 331

The article of the patent in suit is a rubber-tired wheel, and I find that it comprises in its makeup three fundamental mechanical elements, namely, a rubber tire body proper, a metallic rim of channel form forming a seat therefor, and a retaining or fastening means in the form of two independent retaining wires embedded in and extending through the inner or base portion of the tire body. I do not find in either the specification of the patent or the two claims appended thereto any claim on the part of the patentee to inventorship in the broad combination of these three elements. The only statement of invention which I find in the specification is that contained on lines 12 to 14 of page 1, in the words 332 333

> "My invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims"

and the invention is defined in the two claims of the patent in the following terms:

> "1. A vehicle wheel having a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel, and the outer portion having sides at an angle to the inner portion, the angle or

corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

"2. A vehicle wheel having a metallic rim with outwardly projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining wires in said opening, and a re-enforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges, substantially as specified."

The above statements of invention make it quite plain that the invention of this patent does not consist of the broad combination of the three elements named, but rather is to be found in the combination of these elements when having certain specific forms and relations to each other.

Referring first to the specification for a description and explanation of these specific forms of the elements and their specific relation to each other, and considering first the rim, I find that the patentee has described this element as a metallic rim having at its edges outwardly projecting flanges, which flanges, furthermore, extend outwardly from the rim at an angle to thereby form with the base of the rim a groove or channel having tapered or beveled sides and narrower in cross-section at the bottom or inner portion of the channel than at the top or outer portion.

The tire is stated to be "of peculiar shape," and is described quite minutely in connection with the illustration

afforded by the drawing. The patentee's own description 337
of this element is in the following words:

> "The tire proper, c, is formed of substantially the same depth as width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of the rim, the exposed sides of the tire being formed preferably on the lines c^2 at an angle to each other, and also to the flanges b' of the wheel rim. The unexposed portion of the tire, or that portion which is enclosed with the rim, is formed of substantially the same shape as the inner channel of the rim—that is to say, it is tapered from the outside inwardly—so that the side of the inner or unexposed portion of the tire are also formed on the line c^3, forming with the line c^2 338
> an obtuse angle. The lines c^3, however, are less in length than the inside of the flanges b', so that the angle or corner c^4 between the sides c^2 and c^3 falls below the outer periphery of the flange b' and within the channel between said flanges. The opening c' through which the retaining wires pass are also formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4 so that the tops of said openings stand below the outer periphery of the flanges b'.
>
> "The bottom portion of the tire is re-enforced with a canvas strip c^5 which covers the entire bottom and may project slightly along the sides c^3 but 339
> does not in any case extend up as far as the angle or corner c^4."

The retaining means, consisting of the wires d, are described as separate and independent, as extending entirely through the opening c', and as continuous, having their meeting ends united in the application of the tire to the channel.

Most of these qualifications and limitations of the several elements are carried forward into the claims of the patent. In claim 1 the rim is defined as having "angularly projecting flanges to form a channel or groove with

340 tapered or inclined sides." I note that this language is broad enough to cover a construction of rim wherein the flanges forming the sides of the channel are inclined inwardly as well as outwardly relatively to the internal space of the channel, although from the description of the specification and the statements of alleged advantages between lines 83 of page 1 and line 8 of page 2, I presume the patentee had in mind the outwardly inclined form shown in the drawing. The tire is qualified as to its inner portion as "adapted to fit in said groove or channel" and as to its outer portion as "having sides at an angle to the inner portion." The tire is further qualified as to its
341 relation to the rim as having "the angle or corner between the outer and inner portions . . . located within the outer periphery of the flanges." The retaining wires are qualified as independent, as disposed within the inner portion of the tire, and as also within the outer peripheries of the flanges.

The second claim recites the same elements with the same qualifications and limitations in slightly different verbal garb, adding thereto a re-enforcing strip of fibrous material on the bottom of the tire, qualified as disposed wholly within the flanges.

342 The supposed advantages and merits of the tire from a mechanical standpoint are described in the matter between line 83 of page 1 and line 2 of page 2, as follows:

> "The tire has been described thus minutely because the constructions described are important. By having the sides of the exposed and unexposed portions of the tire formed inclined and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove, and no portion of the rubber is forced over the side of the flange which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the

openings c'. The re-enforcing of the bottom of the tire by the canvas strip, which may be formed into the rubber, is desirable, as it has a tendency to prevent the breaking of the rubber below that portion of the tire which is between the retaining wires and the rim. At the same time, by having the canvas strip wholly within the rim, all danger of stripping the edge of the canvas from the rubber which would eventually result in a fracture of the rubber to the opening c' is prevented." 343

I will now take up and briefly describe the several prior art patents introduced as exhibits by the defendant, confining my analysis of said patents to such portions thereof as I deem pertinent to the present comparison. 344

GREENE 169,100. OCTOBER 26, 1875.

The drawing of this patent tells the story plainer than words. The felly of the wheel has secured thereon a flanged rim A of rectangular channel shape, in which is seated a substantially rectangular rubber tire B somewhat rounded at the corners, and secured in the channel by a stout wire C embedded therein substantially centrally thereof. This patent presents a very simple and plain early example of the broad combination of rubber tire, channel seat and endless wire retaining device hereinabove referrd to as the fundamental mechanical elements of the device of the patent in suit. 345

KELLEY No. 321,819. JULY 7, 1885.

This patent relates to a bicycle, and the pertinent parts thereof are Fig. 10 on sheet 3 of the drawings, and the description thereof on lines 89 *et seq.*, of page 6 of the specification. In this disclosure I find the combination of a channel-shape rim having inclined sides or flanges leaning outwardly of the channel, with a com-

346 pound rubber tire having a correspondingly shaped base portion fitted to said channel.

Adjournment taken until Saturday, December 7, 1907, at 10 o'clock A. M.

December 7, 1907. Met pursuant to agreement. Present, same as before.

This patent discloses the shape of rim and inner or base portion of the tire shown by the patent in suit.

KELLEY No. 362,514. MAY 10, 1887.

347 This patent relates to bicycle wheels, and in Figs. 4 and 5 thereof discloses a cross sectional form of rim and tire, wherein the rim is hollow and is provided on its outer periphery with a channel shaped seat for a solid rubber tire, the side walls of the seat inclining outwardly of the channel, and the base or inner portion of the tire being correspondingly shaped to fit the channel seat. Fig. 4 shows the channel seat integral with the rim, and Fig. 5 shows the same as a separate element secured to the rim. In both forms we have the beveled or tapered form of the channel and base of the tire as disclosed in the Grant patent in suit.

348

LATTA No. 341,811. MAY 11, 1886.

This patent discloses in Figs. 1 and 5 a form of rim, tire and fastening means highly suggestive of the structure of the Grant patent in suit. The rim is a hollow rim, a type quite commonly used in bicycles and other like vehicles, and shows in Fig. 5 a channel shaped seat for the tire having inclined sides leaning outwardly of the channel. It shows a solid rubber tire, the inner or base portion of which is shaped to an accurate fit in the seat of the channel while its projecting portion is substantially

semi-circular in cross-sectional outline. It also shows 349
three retaining wires extending longitudinally through the base portion of the tire, the two outer wires lying in holes or openings below the outer edges of the side flanges. I find in this patent substantially the shape of channeled rim and inner or base portion of the tire disclosed by the patent in suit, together with retaining wires located relatively to the tire and channel as in the patent in suit, although said retaining wires are of a slightly wave-like or serpentine form, as shown in Fig. 1.

OWEN, No. 365,091, JUNE 21, 1887.

350

This patent relates to velocipedes, the invention thereof being illustrated in bicycle form; and the invention is directed largely to alleged improvements in the tire and seating rim thereof. The parts of this patent which I deem most pertinent to the present comparison are Figs. 5, 6 and 7 of the drawing, and particularly Fig. 6. This figure discloses a rim of channel form, having sides that flare outwardly of the channel, and a tire body seated therein and substantially fitted thereto, which tire body has a round or convex crown or tread that I find by measurement is formed on the arc of a circle of the same diameter as the width of the rim internally. The 351
outer or projecting portion of the tire has straight sloping sides which terminate in lateral corners or angles that are located slightly within or below the outer peripheries of the side flanges. The sides of the inner or base portion of the tire incline oppositely to the straight sides of the outer portion, forming obtuse angles therewith. I find a correspondence between this disclosure and that of the Grant patent in suit in respect to the shape of the tire; although in its relations to the rim it differs slightly, the tread of the tire being slightly more rounded, and the base not being shaped to an exact fit in the

352 channel. These differences, however, I regard merely as differences of degree, and very slight at that. This patent not only shows, but very clearly describes a construction or shape of tire body adapted to secure the same advantages that are set forth on lines 85 to 95 of page 1 of the Grant patent in suit. I quote from lines 99 to 114 of page 3 of this old Owen patent, as follows:

> "In bicycles and tricycles as commonly constructed the soft rubber tire seated in the grooved rim projects beyond the same in a semi-circular or approximately semi-circular form. As a result of this construction, it is found in rolling over the ground under pressure the tire is expanded laterally, so that it projects beyond the edges of the rim and is sheared or cut off thereby. To avoid this difficulty I reduce the width of the tire outside of the rim or felly, making its sizes (sides) either of a flat or concave form, or of other forms falling within the semi-circle so that when subjected to pressure the lateral expansion or enlargement will not cause the tire to project beyond the rim. This construction is plainly shown in Figs. 5 and 6."

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The matter on lines 85 to 95 of page 1 of the specification of the Grant patent in suit are a mere paraphrase of the matter above quoted from this Owen patent, and the latter might well be substituted therefor. This Owen patent, therefore, negatives any novelty in the idea of reducing the width of the projecting portion of the tire so as to prevent a spreading of the latter under compression over the edges of the sides or flanges, and thus avoid cutting and abrasion of the sides of the tire.

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BEIERSMITH No. 424,452, APRIL 1, 1890.

This patent shows a metallic channeled rim in which the sides or flanges are corrugated, being bent inwardly at their intermediate portions (in cross-section) to fit a narrowed waist of the tire body. The purposes of this

peculiar construction, as stated by the patentee, are two 355
in number. One is to prevent abrasion of the tire, and the other is to permit the insertion of spreading devices for straightening the sides of the channel and permitting the removal of the tire when worn or broken. These advantages are well stated by the patentee in the matter on lines 58 to 69 of page 1 of the specification, as follows:

> "By reference to Fig. 1 it will be seen that the act of corrugating the rim, circumferentially tends to flare the upper or outer edges E of the sides C to cause the same to extend slightly from the rubber tire, thereby preventing an abrasion of the same and allowing the tire to cushion upon the smooth flare 356
> of the rim when compressed by contact with the ground or pavement and allowing of the insertion of rollers or spreading devices for opening the channel when it is desired to remove the tire when worn or fractured."

In this patent I find clearly set forth the feature of so shaping the sides of the tire and the flanges of the rim that the sides of the outer or exposed portion of the tire shall meet the inner walls of the flanges at points inwardly of the outer edges of said flanges, thereby producing a space or clearance into which the compressed rubber may flow to lessen or prevent the compression and 357
flow of the rubber over the outer edges of the flanges, as set forth as one desirable feature of the construction of the Grant patent in suit.

ELLIOTT No. 440,701, Nov. 18, 1890. ELLIOTT No. 440,702, Nov. 18, 1890.

These two patents, both granted on the same date to the same inventor, may profitably be considered together. Both patents show a channel-shaped rim, the side flanges of which are inclined outwardly of the chan-

358 nel, and a solid rubber tire the inner portion whereof is fitted to a seat in said channel. The outwardly projecting portion of the tire is rounded, presenting substantially the cross-section of a semi-circle in both patents. A feature of the rim consists in a rounded edge or bead formed on the outer margin of the side flanges and the purpose thereof appears in the specification of No. 440,701, wherein the patentee says:

> "By making the metallic tire in this manner the rubber tire, when compressed by a direct or lateral pressure, and thereby overlying the metallic edges *b'* will not be cut or injured by said edges, while
359 said edges are made sufficiently high to properly reenforce the rubber tire."

The two patents differ in the fastening means. In No. 440,701 the tire is secured by transverse pins or rivets secured in and through the side flanges of the rim. In No. 440,702 the tire is secured by a long slender flat strip of steel inserted through a longitudinal opening in the tire, the ends of said strip being brought together to secure the tire on the rim, and extended through a radical opening in the felly. Both patents disclose the flaring channel rim of the patent in suit with a solid rubber tire, having an inner or base portion fitted to a seat in said
360 channel. Patent No. 440,702 further discloses an analogous fastening device to the wires of the Grant patent in suit, the equivalency of which with said wires is illustrated in patents to be hereinafter considered.

Woodward No. 443,735. Dec. 30, 1890.

This patent discloses a form of cushion tire and rim for vehicle wheels, which I recognize as an old friend having for some years in the early nineties ridden a Victor bicycle equipped with this rim and tire. Figs. 3 and 4 of this patent are pertinent to the extent of show-

ing a rim of channel shape with outwardly flaring sides, 361
and a tire seated in the channel of said rim, said tire having the inner and outer portions of its side walls inclined to each other and the angle or corner formed at their meeting point located slightly within the outer edge of the channel (Fig. 3), in all of which respects it resembles corresponding features of the patent in suit.

GRANT ET AL. No. 470,483. MARCH 8, 1892.

This patent is interesting to the extent of containing a full disclosure of the manner of connecting the ends of the retaining wires and completing the continuity of the 362
tire as disclosed in the patent in suit. This method consists in compressing backwardly the meeting ends of the rubber tire so as to expose the ends of the wires; then uniting the ends of the wires; and then expanding the compressed ends of the tire back to a position at which they meet over the connected ends of the wires. This is described on lines 67 to 101 of the patent under consideration, and on lines 40 to 50 of page 1 of the Grant patent in suit. While this feature is not specifically set forth in either of the claims of the patent in suit, nevertheless the patent under discussion is interesting as showing that
even this detail of assembling the parts of the tire was 363
borrowed by the patentee Grant from this earlier patent.

WOODWARD No. 481,340. AUGUST 23, 1892.

This patent represents a somewhat later development of the tire of the earlier Woodward patent No. 443,735, above considered. In Figs. 2 and 3 it shows a somewhat closer approximation to the exact form of tapered channel of the patent in suit.

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RODGERS, No. 539,826, MAY 28, 1895.

The parts of this patent principally pertinent to the present comparison are Figs. 6, 7 and 8, and the description thereof on lines 12 to 36 of page 2 of the specification. In this patent I find a channel rim having side flanges with sloping or outwardly flaring inner walls, and a tire body having an inner or base portion accurately fitted to seat in said channel and an outer or projecting portion considerably narrower for the same purpose as the narrowing of the outer portion of the tire in the patent in suit. As alternative forms of a retaining means
365 I find in Fig. 6 a single central fastening wire; in Fig. 7 a pair of fastening wires located side by side, as in the Grant patent in suit, and in Fig. 8 a flat metal core. This patent illustrates the equivalency, so far as the question of invention is concerned, of a single central retaining wire, such as is shown in the patent to Greene No. 169,100, above considered; a pair of retaining wires, as shown in the Grant patent in suit; and a thin flat strip or core, as shown in the Elliott patent No. 440,702. The purpose of narrowing the outer or projecting portion of the tire, as stated by this patentee, is the same as stated
366 in the patent in suit. See the description on lines 12 to 24 of page 2, reading as follows:

> "In Figs. 6, 7 and 8, the tire is shown made in one piece, the inner part, indicated by B', terminating in shoulders b^3, at the outer edges of the rim flanges, and the semi-cylindrical or semi-elliptical part C' (corresponding to the part C) rising centrally from the periphery of the part B', with its sides sufficiently removed from the rim flanges to prevent the part C' from being crowded over upon and cut by said flanges. In this construction, the tire may be perforated for one wire, as in Fig. 6, or two as in Fig. 7, or for a flat metal core, as in Fig. 8."

This patent discloses other features noted in the speci- 367
fication of the patent in suit as peculiarities of the tire of the patent in suit. On lines 51 to 55 of page 1 of the patent in suit it is stated that—

> "The tire proper *c*, is formed of substantially the same depth as width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of the rim."

This description accurately fits the tire disclosed in this Rodgers patent. Barring a slight difference in the form of the inclined sides of the outer or projecting portion of the tire, and the fact that the lateral corners or angles lie at instead of within the outer edges of the flanges, this 368
patent appears to present a substantially complete anticipation of the structure of the patent in suit, differing therefrom only in minute features of form and relation of parts which in my judgment would lie within the ordinary and expected skill of any mechanic familar with this art. So far as any disclosure in the patent in suit is concerned it is immaterial to the attainment of the anti-rubbing and anti-cutting features whether the narrowing of the outer portion of the tire extends only to the outer edges of the flanges, as in the Rodgers patent, or slightly within said outer edges, as in the patent in suit. 369

Coops, No. 20,678 (Design), April 14, 1891.

This patent is of interest in the present comparison chiefly as constituting another illustration in the art antedating the patent in suit of a tire in which the projecting and wear-receiving part of tire is narrow; and more specifically in which the tread or crown is formed on the arc of a circle of much smaller diameter than the width of the rim, and in which the exposed sides of the tire are formed on straight lines at an angle to each other and also to the flanges of the wheel rim. So far as external

370 contour of the outer or projecting portion of the tire is concerned, the Grant patent in suit presents, in the drawing thereof, nearly a Chinese copy of the drawing of this Coops patent, thus showing that the patentee Grant not only was not the originator, broadly, of the narrowing feature (as shown by Rodgers, *supra*), but was not even the originator of the specific form of this narrowing feature disclosed in the patent in suit.

SCHRADER, No. 466,577, JANUARY 5, 1892.

This patent discloses a rim having a pair of parallel channels formed therein to receive and seat the edges of
371 a hollow tire body. The channels are of the outwardly flaring form, and the retaining means consists of a thin band, the edges of which engage grooves in the inner walls of the sides of the tire. An adjustable connecting means for the ends of the band is shown, enabling the band to be drawn as tightly as required to secure the tire to its seat.

DE SPARRE, No. 540,478, JUNE 4, 1895.

This patent discloses one illustration of the very old and common expedient of re-enforcing the base of the
372 tire by one or more strips of canvas cemented thereto or incorporated therein, and presents a complete anticipation of this feature of the Grant tire in suit. Furthermore, this patent affords an answer to that specific feature of the re-enforcing strip recited in claim 2 of the patent in suit, and consisting of the location of said strip as wholly within the side flanges of the rim.

CLAYPOOL No. 431,223, JULY 1, 1890.

This patent illustrates the combination of the three fundamental elements of the tire structure of the patent in suit, namely, the channel rim, the tire body fitted to a

seat therein, and the continuous retaining wires incor- 373
porated in the tire body. Fig. 5 of this patent shows a pair of retaining wires, thus illustrating the equivalency, in point of invention, of one and a plurality of retaining wires.

MYERS No. 468,971, FEB. 16, 1892.

This patent is chiefly of interest as disclosing a channel rim with outwardly flaring side flanges in combination with a rubber tire seated therein, with the side walls of the projecting portion of the tire meeting the inner walls of the side flanges at points considerably below or within 374
the outer edges of said side flanges. In fact, the extent of space thus allowed for the compression of the rubber within the channel as shown in this Myers patent is fully equal in extent to that disclosed in the Grant patent in suit.

BLOSSER & KUNKLE No. 529,474, NOV. 20, 1894.

Fig. 2 of this patent discloses a tire construction which, in all substantial respects, appears to be identical with the structure disclosed and claimed in the patent in suit, with the sole exception that the sloping sides of the outer or projecting portion of the tire meet the inner walls of the 375
side flanges coincidently with the outer edges of the latter, instead of inwardly of said outer edges. In all other respects I find in this figure a disclosure of everything shown, described and claimed in the patent in suit, with the further exception, however, of the fibrous reenforcing strip on the base of the tire which I regard as a matter of no consequence so far as the question of invention is concerned. In this patent is found "A vehicle wheel having a metallic rim with angularly projecting flanges to form a channel or groove with tapered

376 or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel, and the outer portion having sides at an angle to the inner portion," and "independent retaining wires passing entirely through the inner portion of said tire and also within the outer peripheries of the flanges."

Adjournment taken until Monday, December 9, 1907, at 10 A. M.

Monday, December 9, 1907. Met pursuant to adjournment. Present, same as before.

377 In Fig. 6 of this patent the channel rim is shown as of rectangular form in cross-section; that is, the side flanges are perpendicular to the base, and the tire has parallel straight side walls connected by a substantially semicircular crown or tread surface. The claims of this patent are directed to a means of connecting the spoke and felly of the wheel.

BRITISH PATENT TO DALE NO. 12,580, JULY 24, 1891

The subject-matter of this patent is set forth as "Improvements in the India Rubber Tyres and Metal Rims of the Wheels of Bicycles, Tricycles, and Other Velocipedes and Road Carriages." The features of the patent in suit which this British patent discloses are a channel rim, with outwardly flaring side flanges, a rubber tire fitted to a seat in said channel and a relatively narrowed outer or crown portion of the tire that has its outer periphery formed on the arc of a circle of much smaller diameter than the width of the rim. The advantages and results of this construction are the same as those claimed for the device of the patent in suit, being described by the patentee of this British patent in the following language:

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"It is well known that the rider's weight causes 379
that part of a cushioned India rubber tyre which is next the ground to spread out wider than the metal wheel rim, the edges of which latter then cut into the India rubber tyre and very soon destroy the same. This cutting of the tyre by the wheel rim I effectually prevent as follows:—I make a set-off or rebate in the form of a rib along each side of the India rubber tyre corresponding with the periphery of the metal rim which latter I shape to suit the said ribs. That part of the India rubber tyre which projects beyond the metal rim is narrower than that part of the tyre which fits in the rim. When the India rubber is pressed as by the rider's weight, that part of the India rubber tyre which projects beyond the metal rim does not swell out as wide 380
as the rim, and therefore cannot come into contact with the edges of the rim and be cut thereby."

The projecting portion of the tire of this patent is closely similar to that shown in the Rodgers patent No. 539,826 (Figs. 6, 7 and 8), hereinabove analyzed by me; and the above-quoted statement of its purpose and advantages correspond to the description of the same purpose and advantages in the Rodgers patent (lines 18 to 21 of page 2) and to the description of the same purpose and advantages on lines 85 to 95 of page 1 of the specification of the Grant patent in suit.

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BRITISH PATENT TO WELCH, NO. 14,563, SEPTEMBER 16, 1890.

This patentee says, "My invention relates to improvements in the construction of rubber tyres and metal rims or felloes and methods of securing the same one to the other, for the wheels of cycles and other light vehicles;" and he illustrates and describes quite a large variety of tires, both cushion and pneumatic, with a considerable variety of rims and fastening devices, which latter, however, in all of the forms shown take the form of a pair

382 of continuous retaining wires extending longitudinally through the tire body. Figs. 7 and 8 show a practically solid rubber tire fitted to a seat in a channel-shaped rim that has side flanges inclined outwardly relatively to the channel, and secured therein by two symmetrically disposed retaining wires in the base portion of the tire. Fig. 15 shows a pneumatic form also employing a channel rim with outwardly flaring sides, and with the retaining wires located in the inner portions of the tire and within the outer peripheries of the flanges. In all these respects the patentee, Grant, may be said to have borrowed from the prior art as represented by this British
383 patent and others making similar disclosures which I have above discussed.

BRITISH PATENT TO KEARSLEY, NO. 4352. SEPTEMBER 11, 1883.

This patent is chiefly interesting as showing that more than twelve years prior to the filing of the application of the Grant patent in suit, channel rims having perpendicular, inwardly inclined and outwardly inclined side flanges were old and recognized as equivalents, all three of these forms appearing in Figs. 1, 5 and 6 respectively, of the
384 drawings of this old patent. Fig. 3 of this patent also discloses the narrowing of the outer or projecting portion of the tire through the formation of flat tapered sides thereon, corresponding to the sides or surfaces c^2 of the Grant patent in suit.

BRITISH PATENT TO LENTON, NO. 14,812. SEPTEMBER 19, 1890.

This patent shows several forms of tire and rim, in all of which, however, the rim is of the channel shape, and the projecting portion of the tire is somewhat narrowed transversely. The patentee states:

"According to the construction of my tyre as above set forth there is no tendency to overlap the rim, the action of the superincumbent weight being rather to press the rubber well into the hollows of the rim." 385

This patent affords simply another illustration of the practice of reducing or eliminating cutting and abrasion of the tire by the edges of the flanges by reducing the width of the projecting portion of the tire that prevailed long prior to the advent of the patentee Grant into the field.

BRITISH PATENT TO TIMBERLAKE, No. 20,706. DECEMBER 18, 1890. 386

This patent, while showing tires of somewhat different form in cross-section from that shown by the Grant patent in suit and a large number of prior patents above referred to, is nevertheless of interest as disclosing the employment in combination of a solid rubber tire, a channel rim, independent retaining wires passing through the tire and holding the latter in the channel, and a canvas strip on the base of the tire.

Recess for lunch.

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BRITISH PATENT TO WILLOUGHBY, No. 5924, MARCH 26, 1892. BRITISH PATENT TO WILLOUGHBY, No. 18,030, OCTOBER 10, 1892.

These two patents, and especially the earlier, I regard as of prime importance in relation to the question of the novelty or otherwise of the alleged invention of the Grant patent in suit at the time the application therefor was filed in the Patent Office. Referring first to No. 5924, the patentee states:

"My invention is an improved method of securing rubber tyres to their rims, or in the case of a

built up air-inflated tyre, of securing the outer casing of the tyre to the rim."

The patentee then proceeds to describe the novel feature of his invention as consisting of one or more flexible metal coils, which may be either continuous circles of coil, or lengths of coil interpieced with one or more lengths of additonal metal rod or wire (uncoiled), or formed of lengths of coil alternating with straight or uncoiled lengths of their own metal rod in its uncoiled condition. The patentee states that these tire-fastening rods or coils may be passed through a hole formed lengthways in the rubber tire with their ends united, or they may be molded with the rubber of the tire in the molding operatoin. In the drawings of the patent are shown a variety of forms of channel rims. For instance, in Figs. 5 and 7^a is shown a rim in which the side flanges are at right angles or perpendicular to the base of the channel; in Figs. 8 and 8^a is shown a rim in which the side flanges incline inwardly of the channel; and in Fig. 8 is shown a rim in which the side flanges incline outwardly of the channel. In all of these cases, the inner or base portion of the tire is fitted to a snug seat in the channel. Regarding the manner of application of the tire to the channel rim the patentee has this to say, on lines 28 to 34 of page 2 of the complete specification:

> "To apply my invention to ordinary vehicle wheels I select those already tyred with a 'carmont' or somewhat similar shapped channel rim as in Figs. 5, 8 and 8^a, or in the case of new wheels, I provide them with a channel tyre and into this channel I spring my hooped rubber and coil combination or lay the rubber and coil combination around the wheel in the channel before the ends are united and by forcibly drawing the ends of the coil or coils together and uniting them I form the tyre upon the wheel without having to stretch it over the flanges of the channel rim."

In Fig. 8ª of this patent I find clearly shown a construction which answers claim 1 of the Grant patent in suit in every detail. In this figure I find, as part of a vehicle wheel, "a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides." I also find "a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges"; and I also find "independent retaining wires passing entirely through the inner portion of said tire and also within the outer peripheries of the flanges." In claim 1 of the patent in suit the expression "angularly projecting flanges" has reference to the rim on which the flanges are formed. In a broad sense the term "angularly projecting," as applied to a flange, is tautological. Any flange projects at an angle to the surface on which it is formed, or it is not a flange. It is my understanding and belief, however, that in the claim I am considering the patentee intended to designate and point out flanges which were disposed at an angle to the plane of the wheel; in other words, to distinguish from a structure like that shown, for instance, in the old Greene patent No. 159,100, of October 26, 1875, in which the flanges are parallel with the plane of the wheel or normal to the base of the channel. In accordance with this interpretation, the claim would define a construction in which the flanges or side walls of the channel leaned either inwardly of the channel, and shown, for instance, in Fig. 8ª of the British patent I am discussing, or as shown in the Grant patent in suit, in which the flanges or side walls lean outwardly of the channel. Similarly, the expression "outwardly projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered

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394 or inclined sides" in claim 2 of the patent in suit fails to differentiate in terms from the structures shown in Fig. 8^a of the British patent under consideration. In said figure the flanges project outwardly of the metallic rim, and they are at an angle to the plane of the wheel so as to form a channel or groove having tapered or inclined sides. I therefore find in the said Fig. 8^a of this British patent a complete answer in terms to claim 2 of the patent in suit, with the single exception of the reinforcing strip of fibrous material at the bottom of the tire and wholly within the flanges, which was old in the DeSparre patent, as I have hereinbefore pointed out, and the addition of
395 which to the tire of this British patent would not, in my opinion, involve a scintilla of invention.

It is, and always has been, the rule of the Patent Office in passing upon the claims of applicants for patents to construe a claim as broadly and comprehensively as the language of the claim will warrant without doing violence to the usual and accepted meanings of the terms employed; and if, tested by this rule, a claim is not distinguished from a prior art structure, the applicant is required to so change the language of the claim as to make it impossible of reading upon the prior art structure; and
396 this, no matter how far apart in substance the structure sought to be defined by the claim and the prior art structure may be. In my own experience in the Patent Office I frequently had occasion to advise an applicant that one or more of his claims was "met in terms" by a prior art structure; not meaning thereby that the subject-matter of the claim was necessarily unpatentable over the prior art structure, but that the language employed in definition was too comprehensive and sweeping, and must be reformed so as to be incapable, in its widest significance, of application to the prior art structure. If my interpretation of the terms of the claims of the patent in suit, as

above given, is correct, these claims violate the rule above referred to. 397

But even if, as appears to have been the case in the litigation thus far over this patent, the claims be given the benefit of a narrower construction than the plain meanings of their terms imply, and be interpreted as covering only a form of channel in which the flanges or side walls lean outwardly of the channel, the only change necessary in Fig. 8[a] of the British patent under consideration to maintain the anticipating effect of said figure is to incline the side walls outwardly relatively to the channel and correspondingly vary the inclination of the sides of the inner or base portion of the tire to fit the same in the manner 398 shown, for instance, in Fig. 30 of the British patent No. 18,030, granted to the same patentee. To do this would not, in my opinion, involve anything higher in the way of an intellectual effort than is represented by the ordinary and expected skill and judgment of the mechanic familiar with this art. The prior art as thus far considered by me shows that long prior to the entry of the patentee Grant into the field, the particular cross-section of channeled rim to seat the tire was simply a matter of selection and choice. The rim having inwardly turned side walls or flanges had a clinching effect on the base of the 399 tire, and held the latter more securely against radial displacement; but, on the other hand, it was more difficult to get the tire into its seat. The rim having outwardly leaning side walls or flanges afforded more facility for getting the tire on and off, and was not as hard on the tire in point of wear and abrasion, but required more in the way of fastening devices to keep the tire in place in service. The rim having a rectangular channel, was a compromise between the two, sharing in a measure the advantages and disadvantages of both. This patentee Willoughby, in the two patents under consideration, dis-

400 closes all three of these forms, with tire bases shaped to fit all forms. For instance, in Fig. 8^a of No. 5,924, he shows the inwardly turned form; in Figs. 15, 17, 26, 30 and 31 of No. 18,030 he shows the outwardly turned form, and in Fig. 7^a of No. 5,924 and Figs. 21, 22, 23, 24, 25, 27, 29, 32, 33 and 34 of No. 18,030 he shows the intermediate or rectangular form.

Adjourned till Tuesday, December 10, 1907, at 10 A. M.

Tuesday, December 10, 1907. Met pursuant to adjournment. Present, same as before.

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SWISS PATENT TO EVERETT, No. 8,120, FEB. 17, 1894.

The part of this patent deemed pertinent to the present inquiry is the tire and rim construction illustrated in the cross-sectional view Fig. 5 of the drawings, which shows a construction of tire and rim quite similar to that disclosed in the Beiersmith patent, hereinabove considered; the side flanges of the rim leaning away from the side walls of the tire body in the normal or uncompressed condition of the latter, and affording a clearance, as it were, between the two, which permits the tire, when under compression, to flow toward the side flanges and fill
402 up such clearance, and to that extent saving the tire from the abrading and cutting action that would otherwise result from the flowing of the tire over the edge of the side flanges. This side clearance is very marked in this patent, being proportionately as great, and even greater than in the Grant patent in suit.

THE INDIA RUBBER WORLD, JULY 10, 1895.

The extract from this publication introduced in evidence is a brief history of the practical use of India rubber tires on carriages and cabs in England, and is of some

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United States Circuit Court
Southern District of New York
The Consolidated Rubber Tire Company
vs
Fosgate Tire & Rubber Company
In Equity

Defendants Exhibit, Rubber World Article
Frederick G. Goodwin
Notary Public

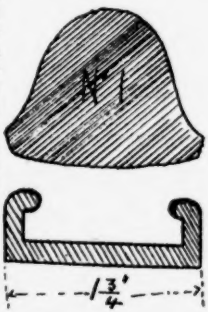
CARRIAGE-WHEEL TIRES IN ENGLAND.

By Joseph Thos. Wicks, Manchester.

INDIA-RUBBER tires for the wheels of carriages and cabs, have been used in England for many years, but sparingly owing partly to defective designs. First we had tires square in section with an ebonite base; these were sent to the carriage-builder who attached them to the felly with side flanges. Then followed dove-tailed tires, with flat tread and ebonite base, held on by side flanges, fitting into the ebonite dove-tails, and bolted to the felly. These dove-tailed tires were moulded in segments, about two feet long or any length. This segmental arrangement allowed any defective piece to be replaced.

Carmont's patent of 1881, and his improvement of 1883, are still in use. The shape of the rubber has received several modifications, but Carmont's idea,—that is, a rubber tire held in a rolled-steel channel in a state of compression,—has not yet been superseded.

These compression tires were perfected in design and wearing qualities after several years of experiments. The tires did not take with the general public, until a wealthy company (The Shrewsbury and Talbot Cab and Noiseless Tire Co., Limited) took hold of them and fitted them to their new hansom cabs in London. London, being paved with asphalt, and the outlying streets with wood, the traffic being light, is the home of the solid rubber compression tire. Asphalt has many advantages; it is (1) level, (2) clean, (3) free from grit, and (4) the traction for horses is easy. Altogether it is certainly the best of roads for India-rubber tires. There are to-day in London approximately 10,000 cabs and private carriages which are fitted with these tires. Cabs, generally, use sections No. 1 and No. 2 with 1¼-inch steel channel. Broughams and other private carriages use No. 3 with 1½-inch steel channel. The sections shown are drawn full size.



A pair of tires, on a hansom, with two relays of horses, lasts from four to six months, in London, the former period being satisfactory. The most approved quality, for cabs, weigh sixteen ounces per lineal foot.

Great efforts have been made to introduce the solid tire into provincial towns, but without good results, owing (1) to unsuitable roads (2) to mud-throwing (3) to greater traction for the horse and (4) to more work for the driver.

Take Manchester, for an example, with the heaviest traffic, paved with granite setts, and enjoying abundant rains. Here where the cabs are heavily built, weighing 11 to 13 cwts. rubber tires are seldom used, and from a cab-driver's point of view they possess several disadvantages. He will tell the inquirer that the horse is compelled to do more work, the rubber tire not rolling so readily as a solid steel tire; that when driving in outlying districts over macadam roads the rubber tire is cut to pieces; on wet days rubber tires throw the mud over cab and horse, so that the driver is compelled to clean down after each fare. The latter appears to be a most serious objection, since the driver cannot afford the time.

Manchester cab-drivers speak well of Challiner's latest patent (No. 10,819), which involves a strip of tough elastic red rubber placed between the felly and the outside steel tire, as shown in section No. 4. The rubber strip forms a cushion, and this arrangement allows the steel tire to roll easily over the inequalities of the road, preventing mud-throwing, reduces considerably the wear of the wheels and of the carriage-body, and saves labor of both beast and man. This tire may be suitable for provincial towns.

Pneumatic tires for carriage-wheels have been tested, but without good results. The Manchester Tramways Co. ran a cab for six weeks. The tires were then punctured and repaired, after which they ran another four weeks; but this life is far too short to be profitable.

At the present time India-rubber manufacturers know of no material,—not even ⅜ or ½ inch rubber tread supported by two plies of 32-ounce cotton duck,—which will stand this hard wear and tear. The weight carried is excessive for rubber in pneumatic-tire design, more particularly on rough uneven surfaces, as

roadways, under a series of long continued blows of 18 to 20 cwts. each.

With pneumatic tires on carriage-wheels the evil of mud-throwing appears in its worst form and is the cause of loud complaint from the coachmen.

A Glasgow firm fitted pneumatic tires to an omnibus. The tires were similar in construction to a piece of belting, six or more plies of cloth, bent arch-shape and bolted to felly, protected with iron flanges, and inflated by a solid rubber tube which was $\frac{1}{16}$ thick in the wall. This omnibus ran five or six days over granite setts, without giving the expected results. The load may be taken at four tons; and the persons who made this £100 trial expected too much. Consider the effect of these heavily loaded pneumatic tires striking against the sharp edge of a displaced granite sett.

Many experiments are going forward, which attract public notice, and indirectly lead to the investigation of the merits of solid rubber tires, for which description there is likely to be a great and increasing demand.

interest as showing the use of solid rubber tires held in 403
channel rims of what is now known as the clincher type. The article contains a reference to the Carmont rim and tire, which is referred to in the matter hereinabove quoted from the Willoughby patent No. 5,924, of 1892. The illustrations accompanying this publication, and particularly that marked "No. 1," show that the idea of relatively narrowing the exposed or projecting portion of the tire-body, as in the Grant patent in suit, was known at the time this article was published.

U. S. Patent to Brown & Stillman, No. 488,494, Dec. 20, 1892. 404

This patent illustrates a pneumatic tire for vehicles which employs, in connection with a channel-shaped rim having outwardly leaning side flanges, a hollow tire-body adapted to be inflated and secured to the rim by a pair of endless retaining wires that are located within the outer edges of the side flanges and entirely within the inner or unexposed portion of the tire, all as in the Grant patent in suit. These pneumatic tires, while differing in appearance considerably from a solid rubber tire, are, nevertheless, when in service filled with a body of compressed air corresponding in its general properties to the interior por- 405
tion of a solid rubber tire; this body of air being highly elastic and capable of being compressed to a density equal to or greater than the density of the interior portion of a solid rubber tire. Hence, the behavior of such a tire, when properly inflated, does not differ substantially, so far as the relation and effect of the retaining wires thereto is concerned, from a solid rubber tire, such as is shown in the Grant patent in suit. This patent is quite similar to the showing in Fig. 6 of the British Willoughby patent No. 5,924, of 1892.

406 Briefly summarizing the conclusions which I have drawn from the foregoing analyses of the prior art patents and publications introduced in evidence by this defendant, I may say, in answer to the question submitted, that I find that at the time of the patentee Grant's entry into the field, not only were all the mechanical elements of the tire construction of the Grant patent in suit old and well known in a large variety of forms, but the specific forms of these elements as shown in the Grant patent in suit, and to a considerable extent the same relations of these elements to each other, as shown and described in the patent in suit, had also been known and practiced. The
407 patentee Grant states, by way of reason or excuse for the minute description of the constructions, that the latter are "important." The only grounds of the alleged importance of this specific construction of the tire which I find in the specification of the patent are, first, the prevention of the cutting or grooving of the tire through forcing of the same over the side of the flange, all of which was well known and recognized, and the same remedy therefor disclosed in the U. S. patents to Owen and to Rodgers, and the British patent to Dale, hereinabove considered; and, second, the prevention of the
408 breaking of the rubber underlying the retaining wires by means of the canvas strip on the base of the tire—a result which would necessarily follow in the DeSparre patent, were the same provided with retaining wires, and which apparently necessarily follows in the British Timberlake patent No. 20,706, of 1890, showing the retaining wires in combination with a canvas strip on the base of the tire. The channel rim having outwardly leaning side flanges was old prior to the patent in suit in nearly all of the prior art publications which I have discussed; endless retaining devices disposed within the body of the tire and in the forms of one or more wires or flat bands

were old and well known; tire bodies having the sides of 409
their outer or exposed portions forming an obtuse angle with the sides of their inner or unexposed portions were old and known; tires having a rounded crown or tread formed on the arc of a circle of less diameter than the width of the rim were old and known; tires having a clearance between the sides of their outer or exposed portions and the side flanges of the rim to allow of the spread or flow of the rubber under compression therein were old and well known; tires having their retaining wires located wholly within the inner or unexposed base portion of the tire and within the outer edges of the side flanges
were old and well known. In several of the prior art pat- 410
ents which I have considered, notably the British patent to Willoughby, No. 5,924, of 1892, and the U. S. patents to Rodgers, No. 539,826, and to Blosser & Kunkle, No. 529,474, nearly all of these features are found in combination. Where the original work of the patentee Grant comes in I fail to discover. The prior art taught him everything that he did, and, so far as I can discover, between such prior art and the article of the Grant patent in suit there exists, in my opinion, scarcely room for the exercise of good mechanical skill and judgment, much less of invention. 411

Recess for lunch.

Adjourned till Wednesday, December 11, 1907, at 10 A. M.

Wednesday, December 11, 1907. Met pursuant to adjournment. Present, same as before.

Q. 7. Have you read and studied, so that you understand the same, the respective opinions of the Courts of Appeals of the 6th Circuit, in what is termed the Goodyear case, and of the Court of Appeals in the Second Cir-

412 cuit, in what, for convenience, is termed the Firestone case?

A. I have.

Q. 8. Mr. Pond, there appears to be, both as to matters of opinion and matters of understanding as to substantially the same conditions of fact diametrically opposite conclusions and results as to such matters as appears by these records, as follows:

In the Firestone case the Court of Appeals of the Second Circuit says:

> "The Grant tire has the capacity which no other possesses, of readjusting itself, after yielding to se-
413 vere lateral strain, without tearing or abrasion of the rubber or injury to any of its parts."

In the Goodyear case the Court of Appeals of the Sixth Circuit said:

> "If this tipping capacity had been pointed out and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved."

The Court of Appeals of the Second Circuit said further:

> "It now appears that the feature which secures patentability is inherent in the patent, and the speci-
414 fication is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature was neither an accident nor an 'obscure property'; it exists in every wheel on which is mounted a tire which follows the teachings of the patent."

The Court of Appeals then states that a quotation which it makes from the opinion of complainants' expert in the Firestone case is correct and quotes the statement of the expert as follows:

> "It is absolutely impossible to adjust the tension

of the wires so that this yielding capacity will not be exhibited in the tire." 415

Will you now please, Mr. Pond, take up these statements of the respective courts and from your knowledge as a solicitor of patents and your experience as you have given as a mechanical expert and engineer, and your study and investigation of the particular questions that must be rightfully solved to determine the questions of facts and mechanics presented by these two opinions as above quoted, and state your opinions and conclusions and your investigations as to this question of fact, not only as to the statement of the Court of Appeals of the 416
Second Circuit, as to whether this tipping capacity or feature secures patentability in the Grant patent and "inheres in no other tire," but whether or not this so-called tipping capacity is as a matter of fact, present in the Grant tire, when rightfully constructed as directed in the Grant patent, and give your reasons in this connection fully for any opinion you may express, and illustrate your conclusions and the fact as to this matter by any drawings, sketches or models that can make your opinion and conclusion any plainer to the court.

By Mr. Staley: The question is objected to as 417
incompetent, irrelevant and immaterial, for the reason that the entire question is based upon false premises, as clearly appears in the decision of the Court of Appeals in the Second Circuit, where, in calling attention to the fact that the records in the two cases are not the same, it says:

"In view of this new aspect of the case, we have no reason to doubt that on the present record the Court of Appeals would reach a result favorable to the patent."

Hence the question, assuming that the facts are

418 the same in these cases, is a hypothetical question, based upon false premises.

A. Knowing that the alleged capacity of the Grant tire to yield in a tipping manner under the side thrust of obstacles and subsequently re-seat itself without injury to the tire or its fastenings constitutes, as to its existence or non-existence, a crucial question in the rightful determination of the validity or invalidity of the Grant patent in suit, according to the decisions of the Courts of Appeals of the Second and Sixth Circuits, respectively, in the cases referred to in the question, I have given careful thought and study to this question, and have supplemented
419 such thought and study by such opportunities as I have had for personal observation of the behavior of the Grant tire in service, and I will state at the outset that my thought, study and observations on this matter have led me to the unhesitating conclusion that, in a Grant tire properly constructed and applied according to the teaching of the Grant patent in suit and the requirements of practical service, no such alleged tipping and re-seating capacity resides in the Grant tire, and no such tipping and re-seating action actually takes place in service.

Proceeding now to a statement of the reasons which
420 compel me to reject this theory as to the behavior of the tire of the patent in suit, which nowhere appears in the patent itself, but which has been so ingeniously and laboriously built up by the complainants' witnesses, and has received the endorsement of this court in the Firestone case, I will endeavor to make plain the following points:

First.—It must be borne in mind that this alleged tipping and re-seating of the tire of the patent in suit takes place at that point of the tire which is in contact with the ground or other obstacle tending to produce a lateral thrust on the tire; it takes place when this point of the tire is under radial compression owing to the superposed

weight of the load imposed by the vehicle and its contents; and it takes place in but a fraction of an instant of time. The resistance offered by the pavement to the load acts directly through the tire at the point of contact of the latter with the pavement, and tends to force the base of the tire to an intimate contact with its seat in the channel rim, which is in direct opposition to the direction of movement which the tire must take in undergoing the alleged tipping action. Any side thrust on the tire at its point of contact with the pavement or ground which might tend to raise the inner portion or base of the tire on that side from which the thrust comes is thus opposed and reduced, even if not entirely neutralized, by and to the extent of the inward radial thrust on the tire, crowding it to its seat in the channel under the influence of the superposed load. 421 422

Second.—The two retaining wires are ever present in the base of the tire, holding it snugly to its seat. The whole purpose and function of these retaining wires, as implied in the very word "retaining" given to them by the patentee Grant, is to hold and keep the tire to its seat in the rim against any and all tendencies to displace the same. In fact, as the court well knows, the fundamental and root meaning of the word "retain" is to hold or keep back, which very properly and accurately defines the character and function of these wires in their relation to the tire and rim. I have personally witnessed the application of a tire to a rim in accordance with the patent in suit, and my own observation confirmed the testimony which I find in the record of the Firestone case stipulated in evidence in this case to the effect that the wires are drawn or stretched up to a point of tightness closely approaching their maximum tensile strength. In an application of a Grant tire which I recently witnessed in this city, I found myself involuntarily retreating from the machine 423

424 as the operator applied the power in tightening the wires, by reason of an instinctive apprehension that the wires would break under the strain and something would be flying through the air. This high tension of the retaining wires means, of course, a considerable compression of that portion of the base of the tire lying between the wires and the rim. Now, it is evident that if, under a side thrust on the outer or projecting portion of the tire in service, one side of the base portion of the tire rises from its seat in the channel to relieve the tire in a measure of the stretching strain that occurs transversely thereof, and prevent the wire from breaking through the base
425 or side of the tire, the wire itself must undergo a total displacement from its normal holding position, that portion of the wire lying in the raised portion of the tire base being slightly bent in the form of an obtuse angle, the two sides of which are substantially tangential to the remaining part of the wire.

Recess for lunch.

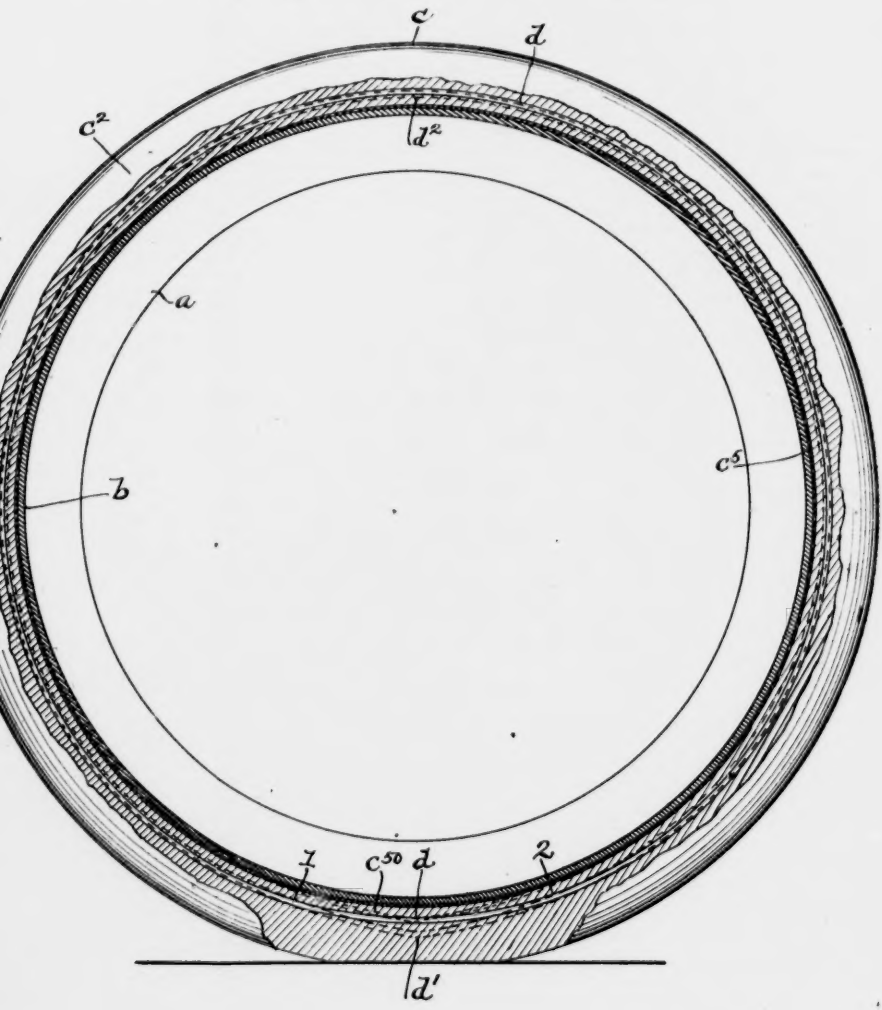
In order that the action I am describing, as well as what is, in my judgment, the real and true action of the tire may be made clearer to the mind of the court than is possible by a mere verbal description, I have prepared
426 a couple of drawings, which I herewith submit.

By Defendant's Counsel: The drawings referred to by the witness are offered in evidence, and it is requested that they be marked, respectively, "Pond Drawing No. 1" and "Pond Drawing No. 2."

By Mr. Staley: The drawings referred to are objected to as incompetent, irrelevant and immaterial, as being mere theoretical drawings and not supported by anything in the record.

Drawing No. 1 represents a side elevation of a vehicle wheel embodying the invention of the Grant patent in

Defendant's Exhibit Pond Drawing No. 1.



suit, the hub and spokes being omitted, the channel rim 427
being in longitudinal section at a point directly inwardly of one of the retaining wires, and the tire itself being partly in longitudinal section in the plane of the same retaining wire. The full lines represent the normal position of the tire and the retaining wire when not subjected to lateral thrust. The dotted lines represent the positions which the retaining wire and the portion of the tire in contact with the ground assume under a lateral thrust, according to the tipping theory. In order to more fully identify this drawing with the patent in suit I have applied to the parts shown therein the same letters of reference that are applied to the corresponding parts in the 428
patent in suit. Now, it will be seen that when the tire tips in the manner more clearly illustrated in Fig. 7 of my "Drawing No. 2," that portion of the retaining wire *d* on the side from which the thrust comes, and directly above the point of contact of the tire with the ground, must be lifted relatively to the base of the channel between the points which I have marked 1 and 2 on "Drawing No. 1," and assumes the more sharply curved or bent form and relative position indicated by the dotted lines which I have marked *d'*. The inner dotted lines, which I have marked c^{50} represent the correspondingly raised 429
position of the canvas base c^5 in the plane in which the section is taken. Now, it is a self-evident geometrical proposition that the raised section of the wire represented by the line 1 *d'* 2 is longer than the normal or non-raised section of the wire represented by the line 1*d* 2. Hence it necessarily follows that the long section of wire represented by the dotted lines, which I have marked d^2, and extending around the wheel between the points 1 and 2 must be shorter than the long section of wire represented by the full lines extending around the wheel between the points 1 and 2. As the wire itself is non-extensible, it

430 follows from the foregoing that the long dotted line section of the wire that extends around the wheel between the points 1 and 2 must be drawn still further into the already highly compressed rubber base of the tire, as indicated by the relative positions of the dotted and full-line indications of the long section of the wire, in order to compensate for the lengthening of the short section between the points 1 and 2 represented by the line 1 *d'* 2. There are two reasons which, in my opinion, render this action of the parts a practical impossibility. In the first place it is evident that the comparatively thin portion of the tire body lying between the raised section of the
431 wire and the base of the channel and longitudinally limited between the points 1 and 2 must withstand a stretching strain sufficient to permit the contraction of the long section of wire extending around the wheel between the points 1 and 2 against the powerful resistance of the already highly compressed rubber underlying said section. That this relatively short and thin section of rubber and canvas will withstand such a strain without disruption staggers my mechanical credulity. In my best judgment, it neither will nor can do anything of the sort. In the second place, a considerably increased tensional strain is
432 necessarily imposed by this alleged action upon the retaining wire itself, which has previously been inserted and secured at approximately the limit of its tensional strength. Accordingly, even if the rubber and canvas between the wire and the rim could stand this stretching strain, the wire itself would break long before any such tipping action as I have illustrated and discussed could reach its limit. I can, of course, conceive of the possibility of such a tipping movement if the retaining wires are inserted with such looseness and freedom from tension as to allow the tire to rock or wobble sideways in the rim, but such a hypothesis is, of course, wholly at va-

Defendant's Exhibit Pond Drawing No. 2.

Fig. 1.

Section of Grant Tire on smooth pavement under no load.

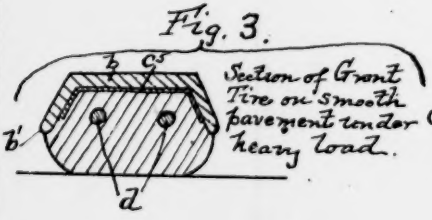
Fig. 2.

Section of Grant Tire on smooth pavement under light load

Fig. 4.

Section of Grant Tire slewing or skidding on a smooth pavement under light load.

Fig. 3.

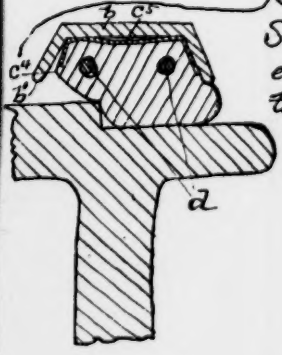


Section of Grant Tire on smooth pavement under heavy load.

Fig. 5.

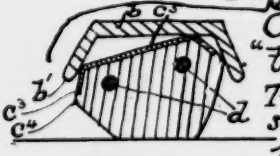
Section of Grant Tire slewing or skidding on a smooth pavement under heavy load.

Fig. 6



Section of Grant Tire encountering side-thrust of a rail of a street-car track under load.

Fig. 7.



Complainant's alleged "tipping" action of Grant Tire resulting from side-thrust under load.

riance with the established practice under the Grant patent in suit, and with the practical requirements of actual service. Were the Grant tires applied and secured in any such manner they would be in the repair shop most of the time being refitted. 433

He is a poor critic and in bad business who cannot and does not offer something as good as or better than that which he tears down. While my convictions compel me to repudiate this fanciful "tipping" theory of the tire of the patent in suit, I have a very decided opinion, based on my knowledge of the inherent qualities and characteristics of the materials and elements making up the Grant tire, my knowledge of the laws and principles of mechanics, and such observations as I have been able to make of the behavior of the Grant tire in service, as to what the latter is, and especially as to how the Grant tire acts, especially when subjected to side thrusts, which I will now proceed to explain, in connection with Figs. 1 to 6, inclusive, of "Pond Drawing No. 2." These figures are free-hand sketches, and no claim of mathematical and geometrical exactness and precision is made for them; but they have been drawn in strict fidelity to all of the detail features of the Grant tire as disclosed in the patent in suit, and will serve to aid the eye of the court in following my description of the real action and behavior of the tire of the patent in suit under various conditions and circumstances. 434 435

Fig. 1, it will be observed, shows simply a cross-section of the Grant tire, substantially like that of Fig. 2 of the patent in suit, with the felly omitted and the tire inverted to represent that portion which rests on the ground. This figure shows the tire free from load, and consequently does not exhibit any cross-sectional alteration or distortion of the tire body. Figs. 2 and 3 represent forms which the tire assumes under light and heavy

436 loads, respectively. These figures represent and support the patentee's own conception of the action of his tire under a load on a smooth ground or pavement, with no lateral deflecting or disturbing influences, as set forth in lines 85 to 95 of page 1 of the specification of the patent in suit, wherein the patentee says:

> "By having the sides of the exposed and unexposed portion of the tire formed inclined and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel, or groove and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the openings c^1."

437

Under a vertical load on a smooth or flat road, that portion of the tire in contact with the road is, of course, flattened, conformably to the surface of the road; the extent of this flattening depending upon the amount of the load and the amount of radial compression of the tire, which latter, of course, also depends upon the load. As the tire is shortened in thickness, or vertically, it, of course, spreads in width or horizontally above the point of contact with the ground, the extent of this spreading likewise varying with the loading, and the straight sides of the tire assuming a somewhat rounded or convex form, as I have shown.

438

In Figs. 4 and 5 I have sought to set forth pictorially the behavior of the tire body under a slewing or sidewise skidding movement of the wheel, such as occurs, for instance, with the rear wheels of a vehicle in rounding the corner at high speed. In such a case the wheel slides sideways, and the friction of the ground on the tread of the tire, of course, opposes this lateral sliding or skidding movement. This tends to throw that portion of the

tire in contact with the ground at the time of the skidding 439
movement toward that side of the rim that is in the rear in the skidding movement. The bodily sidewise movement of the tire relatively to the rim is opposed by the side flange, but inasmuch as the lateral force and the opposition thereto (represented by the side flange) do not act in and through the same horizontal region of the tire body, the latter tends to roll on the inner wall of the side flange, but any bodily displacement of the inner or base portion of the tire is prevented by the retaining wires holding said base portion of the tire to its seat under high tension. Under these circumstances, and with 440
these disturbing and restraining influences operating in the manner described, the outer or exposed portion of the tire simply tends to flow against and over the outer edge of the side flange, the rubber undergoing more or less transverse distortion, according to the load, and likewise undergoing a considerable stretching strain in an oblique direction between the base of the tire on the side foremost in the sliding movement and the portion in contact with the ground. This stretching action results from the side thrust on the tread of the tire and the opposition to any rolling or twisting movement of the tire offered by the retaining wires, more particularly that one 441
on the side opposite to the direction of flow of the rubber. Where this action occurs when the vehicle is under a heavy load, this transverse stretching strain is severe, and the bottom of the tire that lies next to the channel and the inner or unexposed side wall on that side subjected to the tension are locally drawn out of contact with the channel to some extent, as illustrated in Figs. 5 and 6, the retaining wire on that side, however, keeping the strip of rubber and canvas directly between itself and the bottom of the channel in contact with the latter, and preventing anything like a bodily rocking or tipping action

442 of the tire as a whole throughout that portion in contact with the ground.

In Fig. 6 I have illustrated the behavior of the tire when encountering the side thrust of a rail of a street car track under load. Street car tracks are the arch enemy of tires of this class. There is probably nothing else met with in the use of rubber-tired vehicles of this class in cities and large towns that so severely tries and tests the strength of a rubber tire and its fastening means as a street car track. Unless the latter be crossed exactly at a right angle there is inevitably a side thrust or wrench imposed upon the tire at its point of contact with the rail,
443 and this side thrust increases in intensity and force with the acuteness of the angle at which the crossing is made. While a skidding or slewing movement on a smooth surface imposes a frictional strain only upon the tire, tending to distort it laterally, a car track imparts thereto the equivalent of a direct side blow or thrust, resulting from the actual contact of two opposed approximately vertical surfaces having a relative movement in opposite directions. In such case the tire must mount the track or something has got to break, unless the driver relieves the situation in time to prevent accident. In this case, as in
444 the situations illustrated in Figs. 4 and 5, the outer or exposed portion of the tire flows transversely to the extent compelled by the obstruction, which may be to an extent exceeding the limit of the tensional strength of the rubber and canvas underlying the retaining wire on that side on which the strain is principally imposed, in which latter case the rubber and canvas are disrupted, and the tire still further flows over the outer edge of the side flange on the opposite side, the diagonally opposite portion of the tire, freed from the retaining wire, yielding and largely relieving the transverse strain, but at the expense of a broken tire.

It is manifest that an occular demonstration of the exact behavior of the Grant tire under lateral strains is exceedingly difficult, by reason of the entirely concealed condition of the retaining wires, the largely concealed condition of the lowermost point of the tire at which the action takes place, and the instantaneous interval of time within which it takes place; and hence, conclusions and opinions as to what does take place must rest largely on deductions drawn from a knowledge of the characteristics and qualities of the materials and mechanical elements making up the structure, as well as of the laws of mechanics as applied thereto. I may say, however, that I have frequently ridden in vehicles equipped with the Grant tire of the patent in suit, and have watched the action of the tire in crossing a car track at a sharp angle. I have observed that such an encounter of the tire with the car track imposes a severe strain upon the wheel, tending to "dish" it, and I have also observed that the flow or swell of the rubber over the edge of the side flange remote from the track is clearly visible, which is in accordance with the mode of behavior illustrated in Figs. 5 and 6 of "Drawing No. 2." I have also observed the condition of Grant tires that had seen considerable service, and I have seen some in which the tire had been disrupted, both beneath and laterally of the internal retaining wires at one or more points on the tire. 445 446 447

Adjourned till Thursday, December 12, 1907, at 10 A. M.

Thursday, December 12, 1907. Met pursuant to adjournment. Present, same as before.

Answer to Q. 8 continued:

The explanation which I have hereinabove given of the real behavior of the Grant tire under the stress of side thrusts met with in service, and the wearing effect which

448 such side strains have upon the tire, finds confirmation in testimony of practical witnesses which was taken and filed in the early case of Rubber Tire Wheel Company against Firestone Victor Rubber Tire Company *et al.* in the Circuit Court for the Northern District of Illinois, Northern Division, a case which was settled out of court.

By Mr. Staley: Complainants' counsel desires to object, and does object, to all reference to alleged depositions or records or other matters which are not in evidence in this cause and which have not been regularly taken in this cause, as incompetent, irrelevant and immaterial. This objection is by con-
449 sent made to apply to any and all records, memorandums, exhibits, or other matters which the witness may refer to and not properly in evidence herein.

In my affidavit given in opposition to the motion for a preliminary injunction in this cause, I quoted certain portions of the defendant's testimony in that case, which I herewith repeat, reading it from the original signed copies of said testimony which I hold in my hand:

Pages 3 and 4 of the original record, testimony of Frank P. Stone:

"Q. 8. Will you now please state in what man-
450 ner or in what way these rubber tires of the complainant were worn out or destroyed before wearing out in the practical every day use of the vehicles to which you applied them?

"A. Some of the wires holding the rubber onto the channel tire would cut their way down through to the channel—the bottom of the channel. Some would cut through the side. I think that is all.

"Q. 9. Please state a little more explicitly what you mean by complainant's tire cutting through the side.

"A. The oscillation of the vehicle when in motion seemed to draw the rubber of the tire to either side of the channel, causing the tire to break or give away at the outer edge of the channel."

Pages 18 and 19 of the original record, testimony of C. O. Harz: 451

"Q. 11. During the last four years have these complainants' tires worn out in the sense of being rendered useless by wear in distinction from being destroyed or made worthless in some other manner before being worn out?

"A. My argument to the people has always been I am not wearing out your tires, but just throwing them away, for the reason that they didn't wear out on top, but were continually tearing out underneath and on the sides, which according to their promise or verbal guarantee to me, should not be."

Page 28 of the original record, testimony of William S. Adams: 452

"Q. 12. What do you mean by the tire being worn out that you so discover upon this examination?

"A. A tire may appear to have a rolling surface, but still it may be torn out on the sides. You can see wires through the sides of the tire along the flange and other times with this tearing out on the flange, it may be worn out on the under surface."

Pages 35 and 36 of the original record, testimony of Charles F. Kimball:

"Q. 8. Mr. Kimball, will you now please state what are the reasons or causes that arise which make it necessary for you to take off or replace the rubber tires of the complainant? 453

"A. The English tire which we formerly used being vulcanized to quite an extent, wore down to the face of the flanges. On the present patterns of tires, the wires after a certain amount of service, either cut through the rubber sidewise or toward the steel channel before the face of the rubber is worn to the flanges, thus necessitating renewal of the rubbers.

"Q. 9. Have you ever known a single instance in the use of complainant's tire, where the tire was not destroyed by cutting out at the sides or bot-

454 tom before it was materially injured by wear on its tread or surface in use?

"A. So far as my experience goes, all rubber tires held by wires require the renewal from cutting of the wires through the rubber, before the rubber wears down even with the face of the metal flanges.

"Q. 10. Have you ever known an instance where complainant's tire has been worn out in use in distinction from being destroyed by cutting at the sides or bottom?

"A. We put on a hundred of sets of tires that I do not see personally, but from those that have come under my personal observation, the wires have always cut through before the rubber wears
455 down even with the metal flanges."

Page 52 of the original record, testimony of Wallace D. Moone:

"Q. 11. What, if anything, happens to these tires, so that they have to be removed and replaced by other tires?

"A. They cut out either at the side or the bottom, one of the two. Sometimes at the side and sometimes at the bottom.

"Q. 12. Whereabouts do complainant's tires cut out at the sides?

"A. The top of the flange."

456 Page 59 of the original record, testimony of Robert C. Irwin:

"Q. 18. For what reason or reasons do you remove or have you removed the rubber tires of the complainants' and put on new tires therefor? What happens to the tire that necessitates its removal?

"A. In most cases the tire is not worn to outside appearance. But is torn away inside of the channel.

"Q. 19. At what point or points is it torn away?

"A. I have seen it both torn at the sides and also the wire pulled through on the bottom."

Pages 19 and 20 of the original record, testimony of Samuel Lawson:

"Q. 17. What, if anything, happens to these tires in use? 457

"A. Well, I tell you, what I find in them they cut through; and the rubber becomes loose, of course.

"Q. 18. Whereabouts on the tire do they cut through?

"A. Where the wire passes through to hold them on.

"Q. 19. Do they cut through at the sides or at the bottom of the tire?

"A. I have had the wire come through the sides; most frequently, through the bottom."

Pages 29 and 30 of the original record, testimony of William H. Seaich: 458

"Q. 14. Will you now please state what happens to these tires like this exhibit when put to the test of actual use on your vehicles. I mean what is the condition of these tires by reason of such use?

"A. Well, I have had a great deal of bother with them in splitting in two, had some worn very well indeed, but the majority are constantly repaired or made new.

"Q. 15. What do you mean by these tires splitting in two; at what point and in what direction do they split and what in your opinion is the cause of their splitting?

"A. I have always been under the impression 459 that it was caused by the wire cutting from whole and the creeping of the tires.

"Q. 16. In what direction do the wires cut from the whole? Downward towards the bottom of the channel, sidewise or upwards?

"A. Run sidewise right around.

"Q. 17. Do they cut out about on the level with the top of the flange of the channel?

"A. A little below the level."

Page 37 of the original record, testimony of Edward F. Delaney:

"Q. 9. What, if anything, happens to these rub-

460 ber tires in use so that you have to take them off or quit using them?

"A. The wire pulls through.

"Q. 10. Pulls through where?

"A. Pulls through the rubber.

"Q. 11. Whereabouts through the rubber do these wires pull through?

"A. Through sideways and through the bottom.

"Q. 12. Are the tires any good after the wires are cut out or pulled through the sides or the bottom?

"A. No, sir, they are no use at all."

As I stated in my affidavit above referred to, the foregoing is the plain testimony of nine practical men, all of
461 whom had in their business tested and used the Grant tire involved in this suit. I find that their testimony is unanimous to the effect that the side strains unavoidably imposed upon the tread portion of the Grant tire in practical use caused a disruption of the tire either at the sides or at the bottom, opposite the retaining wires, or both, so that, in many instances, "the wire pulled through." If this tipping theory which the complainants have sought to establish in other litigation on this Grant patent involved in the present suit has any foundation in fact and practical experience, I cannot understand how
462 the above testimony of so many witnesses should have so unanimously established a mode of behavior of this Grant tire in practical usage utterly at variance with the saving results of the theory of operation referred to, and at the same time so in harmony with the theory of operation which I have hereinabove asserted and explained in connection with my pictorial illustration of the same in Figs. 1 to 6, inclusive, of "Defendant's Exhibit Pond Drawing No. 2."

Recess for lunch.

Defendant's counsel here offers in evidence the original depositions of the various witnesses taken

in the case of one of these complainants, the *Rubber Tire Wheel Company* v. *Firestone Victor Rubber Tire Company et al.*, in the United States Circuit Court for the Northern District of Illinois, taken in the first instance before John A. Shields, Esq., Commissioner or special examiner in this court, where this case is pending, and in the other instance taken at Chicago, Illinois, before Frederick C. Goodwin, a notary public, and by consent of parties, and requests that the same may be marked "Defendant's Exhibit Original Testimony, Illinois Case, No. 1 and No. 2." 463

By Mr. Staley: Complainants' counsel objects to the foregoing offer and the exhibits referred to as incompetent, irrelevant and immaterial, and not properly identified with any issues herein. 464

Defendant's counsel calls the attention of complainants' counsel to the fact that the complainant in the case identified by the depositions just offered in evidence is the same complainant in this case and one of the corporation complainants shown in this record to own the title to the letters patent in suit; also to the fact that the complainants' counsel, or his partner, Mr. Bowman, attended as counsel for the complainant and cross-examined all the witnesses, and asks if complainants' counsel now insists upon the objection last entered? 465

By Mr. Staley: Complainants' counsel insists on the objection, and also further objects to them on the ground that they are an incomplete part of the record.

By Mr. Offield: Defendant's counsel asks complainants' counsel if he will admit that the bill of complaint in the case identified by these original depositions was a bill of complaint asserting and founded upon solely the Grant patent in suit.

466 By Mr. Staley: Complainants' counsel states that not having the bill of complaint before him, he is unable to admit it, and is inclined to believe that this is not true.

By Mr. Offield: Defendant's counsel states that in view of the objection of complainants' counsel he will hereinafter offer in evidence a certified copy of the bill of complaint of this complainant, and defendant's answer thereto in the above identified case.

Defendant's counsel also offers in evidence the section of tire offered in evidence by complainant in
467 the above entitled cause and proceeded against as an infringement, and marked in that case "Complainant's Exhibit, Sample of Defendant's Tire," and requests that the same may be identified by such marking as an exhibit in this case.

By Mr. Staley: Last objections are repeated.

Complainants' counsel asks defendant's counsel if Harvey S. Firestone was a defendant in the case referred to in the alleged depositions, and if it is the same Harvey S. Firestone that was the defendant in the recent suit decided by the Court of
468 Appeals in the Second Circuit, and the record of which has been stipulated in this record; also if the counsel for the defendant in this case is the same counsel that appeared for the said defendants in both the Firestone Victor case in which the said alleged depositions were taken, and also for the Firestone case decided by the Court of Appeals, and the record of which is stipulated herein?

By Mr. Offield: Defendant's counsel replies that there is no Harvey S. Firestone defendant in the bill of complaint in the record in the Firestone case in the Second Circuit, and that bill of com-

plaint was solely against the corporation alleged in 469
the bill of complaint to be organized and existing under the laws of the State of West Virginia, and that therefore the request of counsel recites as a fact a condition not existing, and his question cannot be answered as there put.

Defendant's counsel states that his firm was the attorney for all of the defendants, corporations and individuals, in the Illinois case identified by the depositions offered in evidence, and that Harvey S. Firestone appears to be one of the individual defendants. Defendant's counsel states that his firm were at- 470
torneys for the sole corporation, if any, in the case against Firestone Tire & Bubber Company in the Second Circuit.

By Mr. Staley: Complainants' counsel asks defendant's counsel if Harvey S. Firestone, who testified in what is known as the Firestone case, that he was the president of the defendant company, Firestone Tire & Rubber Company in that case, as appears on page 275 of the Firestone record herein stipulated, is the same Harvey S. Firestone that was a party defendant in the Illinois suit, or Firestone-Victor case, and if the said Harvey S. Firestone was 471
not a managing officer of the said Illinois Company, Firestone Victor Company, if the same was a corporation?

By Mr. Offield: Defendant's counsel states that he does not know, but he would not be at all surprised if he was the same man.

Q. 9. You have not directly answered what was intended to be inquired of in direct Q. 8, relating to the decision on seemingly a question of mechanics, as appears in the Court of Appeals' decision of the Second Circuit. In the two paragraphs from the opinion quoted

472 in the question there appears a statement that the Grant tire has the capacity which no other possesses of readjusting itself after yielding to severe lateral strains without tearing or abrasion of the rubber or injury to any of its parts, the Court of Appeals saying, further, that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. What have you to say, as a mechanical engineer and expert, as to this seeming statement of fact as to mechanical construction and operation of the Grant tire as compared with various other exhibit old patents that have been selected and discussed by you?

473 A. If it be a fact that this tipping and automatic readjusting or re-seating capacity inheres in the Grant tire by virtue of its construction and the arrangement of its parts, it necessarily follows that any other tire construction having the same elements in substantially the same forms would also possess this alleged capacity. The question is undoubtedly purely one of mechanics. If the tire has the capacity to rise from the channel rim on one side under a lateral thrust from that side on the exposed portion of the tire, it must be chiefly, if not entirely, due to the outwardly leaning form of the side flanges which
474 allow the clearance necessary for such a rising and falling movement of the side of the tire. Obviously this action could not take place where the base of the tire has a snug fit in a "clincher" rim, or any rim having the side flanges leaning inwardly of the channel.

I do not assume that the statements of the court referred to in the question were intended to embrace or have any reference to the prior art structures, such, for instance, as appears in Figs. 4 and 5 of the Kelley patent No. 362,514, or in Fig. 6 of the Owen patent No. 365,091, which show channel rims having outwardly flaring sides, with tires seated therein, but without retaining

wires, being presumably secured by cement, because it is 475
undoubtedly a fact that these tires, not being held to the base of the channel by strong mechanical fastenings, such as the retaining wires of the patent in suit, might easily rock or tip under side thrust and automatically reseat themselves by virtue of the inherent resiliency of the rubber twisted by such a tipping movement and automatically tending to resume its original and normal shape. I myself have seen this very thing happen in the case of the tires of some of the earliest bicycles which I ever rode, which were solid rubber tires, cemented in channel-shaped rims of substantially semi-circular form in cross-section. Where the hold of the cement had broken at points, the 476
tire would tip laterally and spring back by reason of its own elasticity on striking an obstacle in the road that displaced the tire locally. I shall assume that the court had reference to tires having mechanical fastening means, like, or generally similar, to the endless retaining wires of the patent in suit.

Take the Latta patent, No. 341,811, the same being an exhibit in this case, and consider Figs. 1 and 5 thereof. This patent discloses a channel rim having outwardly flaring sides affording clearance for the edges of the tire in any rising movement from the rim; it has a tire, the 477
base of which fits the rim, and it has a pair of endless retaining wires passing through the sides of the base, respectively. I can see no reason in mechanics why, if the Grant tire will tip and automatically reseat itself under lateral thrust, the Latta tire should not do the same. So far as I understand the conditions supposed to be present in the Grant tire favorable to this action, all of these conditions are present in the Latta tire.

The Elliott patent, No. 440,702, November 18, 1890, one of the exhibits in this case, shows a tire having a base fitted to a channel rim with outwardly flaring sides, and

478 a retaining strip or tape extending longitudinally through the tire. If the Grant tire can tip and reseat itself in the manner claimed for it, I see no reason in mechanics why this Elliott tire should not do the same thing, except at the point at which the ends of the retaining band are secured to the felly.

Take the Rodgers patent, No. 539,826, May 28, 1895, one of the exhibits in this case, and assume that the form of tire shown in Fig. 7 is in the channel rim illustrated in Fig. 1, which channel rim has side flanges with outwardly inclined inner walls. The tire is secured by a pair of endless retaining wires embedded longitudinally
479 therein and thereof, and bearing in mind that the rubber base of the tire is compressible and capable of more or less change of form, I see no reason in mechanics why, if the retaining wires will permit one side of the tire to lift, the tire should not tip in the channel in either a sliding or rocking manner and automatically reseat itself. The conditions favorable to this action are present in the structure of this patent to approximately the same extent that they are present in the structure of the Grant patent in suit.

The British patent to Welch, No. 14,563, September
480 16, 1890; the British patent to Timberlake, No. 20,706, December 18, 1890; the U. S. patent to Schrader, No. 466,577, January 5, 1892; the U. S. patent to Brown & Stillman, No. 488,494, December 20, 1892; and the U. S. patent to Blosser & Kunkle, No. 529,474, November 20, 1894 (Fig. 2), all exhibits in this case, all exhibit tire constructions involving a channel rim with outwardly flaring side flanges, a tire having a base seated in said rim, and a pair of endless retaining wires embedded in the sides of the tire base and holding the latter to its seat in the channel, and in all of these structures the relative shapes of the tire and rim are such that, if the retaining

wires will permit it, the tires can tip laterally under side 481
thrusts with either a rocking or transverse sliding movement and automatically reseat themselves when the deflecting force is relieved.

The British patent to Willoughby, No. 5,924, March 26, 1892, one of the exhibits in this case, shows in Fig. 6 a tire, rim, and retaining wires, capable of the described action if the retaining wires will permit it; the Willoughby patent (British) No. 18,030, October 10, 1892, also one of the exhibits in this case, shows in Fig. 30 thereof a cross-section of tire possessing the mechanical prerequisites of this tipping action, if the retaining wires will 482
permit it; and if, as I have already before pointed out, the form of channel rim and tire base shown in Fig. 30 of this patent be substituted for the form of channel rim and tire base shown in Fig. 8[a] of the other Willoughby patent, No. 5,924, the exact Grant construction, as to all of its details is present, and it would inevitably follow that in such a case all of the qualities, capabilities, and characteristics of the Grant tire would be present.

I have examined the specifications and claims of all of these prior patents to which I have last referred, and I fail to find therein any word, hint or suggestion of any such tipping and reseating capacity. Neither do I find 483
anywhere in the drawing, specification, claims or file record of the Grant patent in suit any word, hint or suggestion of this capacity. The simple reason I believe to be because it does not exist either in the Grant patent in suit or in any of these prior art patents which I have considered (excepting those not having mechanical fastening devices). With all due respect, therefore, to the views of the court as expressed in those portions of its opinion referred to in the question, I am compelled for mechanical reasons to dissent from the statement that "the Grant tire has the capacity, *which no other posses-*

484 *ses*" (italics mine), "of readjusting itself, after yielding to severe lateral strain, without tearing or abrasion of the rubber or injury to any of the parts," and also from the statement in the same opinion that "no intelligent mechanic can follow Grant's directions without securing the tipping action *which inheres in no other tire.*" (Italics mine.)

Q. 10. Do you find in this Grant patent any thought, idea or suggestion in any way, either in drawings, specification or claims, that would lead you to suppose that following the Grant patent there resided in that patent any tipping capacity of the tire, or that said patent had in
485 any way disclosed a capacity of the Grant tire to tip or readjust itself after yielding to severe lateral strain?

A. I do not find in this Grant patent any such thought, idea or suggestion, or anything that would lead me to suppose from a reading and study thereof that the construction disclosed and covered by the patent possessed any such capacity, either as to the tipping or the subsequent reseating or readjustment.

Adjourned till Friday, December 13, 1907, at 10 A. M.

486 Friday, December 13, 1907. Met pursuant to adjournment. Present, same as before.

Answer of witness to Q. 10 continued:

The court says, in the opinion from which I have above quoted, that

> "It now appears that the feature which secures patentability is inherent in the patent . . . . This feature was neither an accident nor an 'obscure property'; it exists in every wheel on which is mounted a tire which follows the teachings of the patent."

I know from my nine years' experience as a Patent Office examiner that it is not the practice of the Patent

Office to issue patents wherein "the feature which se- 487
cures patentability" is not clearly and distinctly set forth. In fact, the feature or features which secure patentability are those which are required to be shown and described with the greatest clearness and fullness for the benefit of the public, that they may know how to practice the invention when the patent shall have expired. No Examiner of the Patent Office, who is faithful to his sworn duty, allows a patent to issue under his favorable judgment thereon with the feature which secures patentability, whether it be a mechanical element or a novel quality or capacity flowing from a new arrangement or harnessing of old mechanical elements, not fully described in 488
plain terms in the specification of the patent. The feature which secures patentability in any properly issued patent is the feature of all features required to be made known with the greatest completeness and certainty. Hence I am confident that the Examiner who passed upon and allowed the application for the Grant patent in suit had no knowledge or even suspicion of the existence of this alleged quality or capacity of the Grant tire to tip and yield under side thrust in a manner to save the tire from injury and automatically readjust and reseat itself, or he would have required a full and clear description of this 489
feature or capacity to have been inserted in the specification before the application would ever have been passed to issue by him. So far as the "teachings of the patent" are concerned, they teach a lot of old things equally well taught in the art antedating the patent in suit, such as the shape of the channel rim, the cross-sectional contour of the tire, the retaining wires and their location in the tire and rim, and the canvas reinforcing strip—but not one word of teaching do I find in the patent in suit about this alleged novel quality or capacity of the Grant tire which is supposed to elevate it to the dignity of an invention.

490 Q. 11. Have you read the file-wrapper and contents of the Blosser & Kunkle patent, which is in evidence as an exhibit in this suit, so that you understand the same and the actions of the Patent Office in relation thereto as disclosed by this exhibit?

By Mr. Staley: The question is objected to as irrelevant and immaterial, since it appears by the records herein that the Blosser & Kunkle patent was subsequent to the Grant invention, and that the patent itself is for an entirely different subject-matter, being an improvement in wheels, and that the form of the tire shown therein as an incident to the pat-
491 ent was obtained from Grant.

A. I have.

Q. 12. You have heard the objection entered by complainants' counsel, will you now please examine this file-wrapper and contents of the Blosser & Kunkle patent as sworn to in the application first filed, and state, first, whether you find that application to be as indicated by the objection, for an entirely different subject-matter from the Blosser & Kunkle patent, and whether or not you find anywhere, either in the file-wrapper and contents of this Blosser & Kunkle patent or the patent itself any
492 thought, idea or suggestion that this tipping capacity now asserted by the Grant patent is present, or ever was present, in the application of Blosser & Kunkle, or in any discussion in the Patent Office relating thereto?

By Mr. Staley: The question is objected to as irrelevant and immaterial.

A. So far as the claims finally allowed in the Blosser & Kunkle patent are concerned, they relate to a securing means between the spokes and the felly of a wheel, rather than to a tire construction. I find, however, that both the specification and the drawing clearly disclose a tire construction, and I find that as the application was

originally filed it contained a claim going to the tire construction, which claim was original claim 4, as follows: 493

> "The combination with a wheel having a grooved felly, as described, of a rubber tire secured in said felly by retaining wires and having a central groove or recess on the inside of said tire and within said felly, substantially as specified."

Hence, I do not find that the Blosser & Kunkle application, as originally filed, was for an entirely different subject-matter from the Grant patent. I have carefully examined the file record of this Blosser & Kunkle patent as introduced in evidence, and I fail to find therein any thought, idea or suggestion that this tipping capacity now 494 asserted of the Grant patent was ever present or brought out in the application or file record of the Blosser & Kunkle patent, so far as I have examined same. In view of the fact that Blosser & Kunkle show in Fig. 6 a rectangular form of channel rim, which would not allow of the tipping movement of the tire, I am led to the opinion that Blosser & Kunkle never had any idea of this movement or capacity in connection with their patent.

By Mr. Staley: Complainants' counsel objects to the answer as irrelevant and immaterial.

Complainants' counsel also desires now at this time to object to the alleged file-wrapper as incompetent, 495 as well as irrelevant and immaterial, since it now appears that the alleged file-wrapper is not a complete file-wrapper of the said Blosser & Kunkle patent, but excerpts therefrom.

Recess for lunch.

Q. 13. Calling your attention again to this Blosser & Kunkle patent and to Figure 6 of said patent, and bearing directly upon the question as to whether a tipping or canting capacity and the capacity for the tire to rise and fall with varying lateral pressure put upon it, I will ask

496 you as to a tire constructed as shown in Figure 6 of this patent, what would be the effect upon the tire itself if the tipping capacity were present in such tire when under a heavy load the tire should be raised upon one side and canted over to the extent, say, as shown in Fig. 7 of "Pond Drawing No. 2"?

By Mr. Staley: Question objected to as irrelevant and immaterial, for the reasons before stated.

A. If it were possible for the tire shown in Fig. 6 of the Blosser & Kunkle patent to tip in the manner suggested in the question, it is evident that the crown of the tire would be forced over the edge of the vertical side
497 flange on the side opposite that from which the lateral thrust came, and would cut and grind the tire severely. This fact confirms me in my opinion that no such capacity of the tire was ever contemplated or known by the patentees Blosser & Kunkel, inasmuch as they illustrated this rectangular form of channel rim in the same patent with the flaring form of Fig. 2.

Defendant's counsel here offers in evidence copy of file-wrapper and contents of Grant patent in suit, and requests that the same may be marked "Defendant's Exhibit File-Wrapper and Contents Grant Pat-
498 ent."

Q. 14. Have you read and examined, so that you understand the same, the Exhibit File-Wrapper and Contents of the Grant Patent in suit?

A. I have.

Q. 15. Will you now state whether or not there is anything in this file-wrapper and contents that suggests this "tipping capacity," or the automatic seating and unseating of the Grant tire in actual use, and, in fact, what is the effect, if any, of the study of this Grant file-wrapper and contents as to either the presence or absence of this alleged "tipping capacity"?

A. I have found nothing in the file record of the pat- 499
ent in suit in any way relating to or suggesting this tipping capacity, and my examination of the file record affords still further confirmation of the opinion heretofore expressed that neither the applicant nor the Patent Office had any knowledge, or even suspicion, of the existence of this alleged tipping capacity in the Grant tire. But even if the knowledge of this capacity, although entirely unexpressed in the application as originally filed, had resided in the mind of the inventor, the limitations imposed upon the original claims by amendment would apparently show an abandonment of this feature by the applicant, and for the reason that, while the first claim as originally 500
filed and subsequently withdrawn did not include the retaining wires, the first claim of the patent substituted therefor does include the retaining wires; and, as I have above stated, the presence of these retaining wires is, in my opinion, antagonistic and fatal to the existence of this alleged tipping capacity. The application as originally filed contained three claims, of which the third became claim 2 of the patent. The first two claims as originally filed read as follows:

"1. A rubber tired vehicle wheel having a metallic rim with angularly-projecting sides so as to form 501
a tapered channel or groove, a rubber tire within said channel or groove having the inner or unexposed portions tapered to fit said channel or groove, and the outer or exposed portions formed at an angle to each other and to said flanges, the angle or corner between the sides and the exposed portions being placed within the outer periphery of said flanges, substantially as specified.

"2. A vehicle wheel having a metallic rim with outwardly projecting flanges at an angle to the plane of the wheel and adapted to form a groove or channel having tapered sides, a rubber tire fitted into said channel and having the unexposed portions formed to fit in said groove or channel and the outer

502 or exposed portions formed at an angle to said unexposed portions, said exposed portions being united by a curve of smaller diameter than the width of said groove, openings extending entirely through said tire, and independent retaining wires in said openings, said retaining wires being located in the unexposed portion of said tire or entirely within said channel or groove, substantially as specified."

These two claims were stated to be met in and devoid of any patentable novelty over the English patents to Lenton, No. 14,812, of 1890, and to Eldregde, No. 3,014, of 1890. The Examiner also referred to the U. S. patent to Rodgers, No. 539,826, and to the English patents to
503 Timberlake, No. 20,706, of 1890; to Willoughby, No. 5,924, of 1892, and to Wynne, No. 2,461, of 1889, as showing it to be old to use two wires to hold the tire to the rim. He also referred to the U. S. patent to De-Sparre, No. 540,478, of June 4, 1895, as showing fabric attached to the base of the tire. In response to this action the applicant amended by cancelling these two claims and substituting therefor the first claim of the patent. Comparing the first claim of the patent with the first claim originally submitted, I find that they differ chiefly in the inclusion of the retaining wires in the first claim
504 of the patent located and arranged in a particular manner and relation to the tire and rim. The first claim of the patent differs from the original rejected second claim chiefly in the specific location of the angle or corner on the side of the tire which was not specified in the original second claim as to its particular location relatively to the flanges. The first claim of the patent also omits the qualification contained in the original second claim of the exposed portions of the tire as united by a curve of smaller diameter than the width of the groove or channel. The warrantable inference from this record is that the applicant acquiesced in the holding of the Examiner that orig-

inal claims 1 and 2 were devoid of patentable novelty, 505
and apparently the only point or feature on which the first claim of the patent secured favorable consideration as compared with the original rejected first and second claims was the specific location of the angle or corner of the tire body formed at the meeting point of the outer and inner portions within the outer periphery of the flanges, whereby, according to the teaching of the specification,

> "all portions of the rubber are retained within the channel or groove, and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or 506
> angle, which would eventually cause the tire to break from this point inwardly to the openings c'."

Apparently the Examiner overlooked the fact that this specific location of the angles or corners on the side of a tire relatively to the side flanges of the rim was old in such patents as Owen No. 365,091, Woodward No. 443,735, and Meyers No. 468,971, and that the saving results upon the tire due to this feature and the narrowing of the exposed portion of the tire (according to the patentee Grant) were old and fully described in such prior patents as the Beiersmith patent No. 424,452, the Rodgers patent No. 539,826, and the British patent to Dale, No. 507
12,580, of 1891. From the fact that the Examiner, in rejecting original claim 2, which included the retaining wires, cited the British patents to Lenton, and to Eldredge (neither of which shows retaining wires), and further cited the Rodgers patent and the English patents to Timberlake, to Willoughby, and to Wynne, as anticipating the feature of two retaining wires, it appears conclusive that the Examiner did not regard the mere bringing together of these two features (the shape of tire and channel, and the retaining wires) as involving patentability.

508 Inasmuch as the feature of the specific location of the angles or corners of the tire within the outer peripheries of the flanges has no special relation to the particular securing means (the retaining wires), nor to the particular shape of the channel, so as to form a true combination therewith effecting a distinctly novel and improved result, it is a warrantable inference that the Examiner would have rejected the first claim of the patent in the same manner in which he rejected the original second claim (withdrawn) had he been aware of the lack of novelty in this feature of the specific location of the corner or angle of the tire relatively to the side flanges,
509 which, as I have said, apparently constituted the turning point on which the first claim of the patent was allowed. In further answer to the question, I may add that in none of the correspondence between the applicant and the Patent Office do I find any mention or suggestion of the alleged tipping capacity of the tire, which, had it been known at that time, would undoubtedly, I think, have been strongly urged as an argument for the allowance of the patent.

Adjourned till Saturday, December 14, 1907, at 10 A. M.

510

Saturday, December 14, 1907. Met pursuant to adjournment. Present, same as before.

Q. 16. Have you examined carefully, so that you understand the same, both as to construction and purpose of use, the two exhibits present in this case marked "Complainants' Exhibit Defendant's Rubber Tire" and "Section of Diamond Rubber Company Tire"?

A. I have.

Q. 17. Will you now take up and compare both of these exhibits just called to your attention with "Complainants' Exhibit Complainants' Patent in Suit," and

state whether or not you find the alleged inventions, com- 511
binations and devices of either of the claims of the Grant patent in suit—embodied in or contained in either of these exhibits professing to represent defendant's tires, just called to your attention, and give your reasons fully and in detail for any opinion you may express as to this matter?

A. I will first consider the smaller exhibit, "Section of Diamond Rubber Company Tire," which apparently is a section cut from the periphery of the larger exhibit, marked "Complainants' Exhibit Defendant's Rubber Tire." I find in this exhibit the three fundamental me- 512
chanical elements of a solid rubber tire, a channel rim and a pair of retaining wires, which I find in the Grant patent in suit, and which, as I have already pointed out, were borrowed by the patentee Grant, both individually and in combination, from the prior art long antedating his alleged invention. Considering first the rim, I find a considerable difference between its specific structure and the specific structure of the tire of the patent in suit. In the rim of the patent in suit the side walls or flanges diverge at a considerable angle from the vertical, being about 21 degrees by actual measurement, and both the inner and outer walls of the side flanges thus diverge, be- 513
ing substantially parallel. The side flanges of the defendant's rim are of different form and divergence. The inner walls, which lie next to the tire, exhibit a divergence of less than 10 degrees from the vertical, while their outer walls are rounding or convex, and throughout their upper or outer halves, lean inwardly of the channel at an angle of about 10 degrees. The mean radial line of the flange in defendant's channel is about perpendicular or normal to the base of the channel. Hence, it cannot be said of the defendant's channel that "These flanges *b'* extend outwardly from the rim *b* at an angle," as the

514 complainants' tire is described in the specification of complainants' patent. Furthermore, the inner walls of the side flanges of the exhibit of defendant's tire which I am considering are slightly hollowed or concaved in cross-section, whereas the corresponding walls in the patent in suit are straight.

Considering next the form and structure of the tire itself, I also find several differences between the tire of the patent in suit and the tire of the exhibit under consideration. The tire of the patent in suit has on its outer or exposed portion straight sloping sides (in cross-section), fully twice the length of the oppositely sloping or
515 inclined sides of the base portion of the tire, and forming an angle of 137 degrees with the latter, by measurement. The defendant's tire has on its outer or exposed portion much shorter approximately straight sloping sides, but slightly longer than the sides of the inner or base portion, and formed at an angle of 162 degrees with the latter, by measurement. Furthermore, I do not find in the sample of defendant's tire under examination any clearly defined angle or meeting point between these inner and outer sides, as in the complainants' patent. In the molding of the tire of the exhibit of defendant's construction there
516 appear to have been formed at the junction of these outer and inner sides small ribs or fins which appear to have been smoothed or planed down more or less at various points, forming at such cross-sectional points short radial lines connecting the oppositely sloping lines marking the cross-section of the inner and outer portions of the tire. The effect of this is to make these inner and outer lines that define the cross-sectional form of the sloping sides of the inner and outer portions of the tire practically continuous, so that it is impossible to say where the corner or angle between them is located, or whether it exists at all. Of course, the fact that both the inner and outer

sides of the tire in the defendant's structure much more nearly approach the vertical or radial line of the tire makes the obtuse angle between them much larger and nearer the vanishing point than in the case of the complainants' patent in suit. 517

In the patent in suit the openings or holes through which the retaining wires pass are shown and described as

> "formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b'."

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In so far as I am able to locate the angles or corners on the sides of the section of defendant's tire introduced in evidence, I do not find that this is at all correctly descriptive of the latter. The openings for the wires in defendant's tire are apparently not more than half within the inner or unexposed portion of the tire, their upper or outer halves lying within the outer or exposed portion of the tire. Neither do I find that the tops of these openings in defendant's tire "stand below the outer periphery of the flanges," but are just about on a line connecting the outer peripheries of the flanges.

In both complainants' patent and the exhibit of defend- 519
ant's tire under examination, I find a strip of canvas on the base of the tire and extending partly up on the unexposed sides of the tire.

Having thus pointed out such similarities and differences as I find between the Grant patent in suit and the section of defendant's tire, which I have examined, I will turn to the claims of the patent in suit and compare these with the exhibit "Section of Defendant's Tire." Preliminary to this, however, I may say that I find no substantial differences between the larger exhibit, "Complainants' Exhibit Defendant's Rubber Tire," and the smaller

520 exhibit, "Section of Diamond Rubber Company Tire," which, as above stated, apparently has been cut out of the first and larger exhibit. The excised section appears to be a fair and accurate representative of the complete exhibit from which it is taken. In comparing the claims with these exhibits I shall consider the claims at their face value, and without attempting to place any construction or interpretation upon them in respect to scope beyond such as I think was clearly intended by the patentee.

Adjourned till Monday, December 16, 1907, at 10 A. M.

521

Monday, December 16, 1907. Met pursuant to adjournment. Present, same as before.

Answer to Q. 17 continued:

Considering first claim 1, I note that the claim is addressed to and covers a complete vehicle wheel, and the first element recited in the claim as a part of said wheel is "a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides." As I have already pointed out, this description of the rim is somewhat vague and indefinite. The description does

522 not disclose with what the projecting flanges form an angle; nor does it disclose whether the taper or inclination of the sides of the channel leans inwardly or outwardly of the channel. Assuming, however that the drawing and specification of the patent explain what is meant by this description in the claim (since it is the function of drawings and specifications to explain and clarify ambiguities and uncertainties in the claims), the matter above quoted from the claim refers to a metallic rim having side flanges which lean outwardly of the channel at an angle to the plane of the wheel. I do not find in the exhibits of the defendant's tire offered in evi-

dence a metallic rim completely responsive to this defini- 523
tion. In the defendant's wheel the rim has substantially radially projecting flanges, which, considered as a whole, are substantially parallel with the plane of the wheel, each of these flanges having an inner wall that leans slightly outwardly of the channel and an outer wall that leans to about the same extent inwardly of the channel. In order to make this element of the claim readable upon the defendant's tire, as well as upon the tire of the complainants' patent, it would be necessary to change the reading of this element in the claim somewhat as follows: *A metallic rim with flanges the inner or tire-engaging walls of which are tapered or inclined so as to lean out-* 524
wardly of the channel. I do not find, however, such a definition of the rim in the claim.

The second element of the claim is "a rubber tire," and this element is limited and qualified to the extent that its inner portion "is adapted to fit in said groove or channel" and its outer portion has "sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges." In the exhibits of the defendant's tire submitted there is a rubber tire having inner and outer portions, but I do not find that the inner portion either 525
fits or is adapted to fit the groove or channel of the rim. The inside width of the channel of the rim in the exhibits of defendant's tire is fully an eighth of an inch wider at all points than the width of the base of the tire, which would permit such an extent of lateral shifting and wobbling of the tire in the rim and such an easy accumulation of dirt and other deleterious matter between the tire and the rim as to make the tire practically useless in service. As to whether or not in the defendant's tire the sides of the outer portion form an angle with the sides of the inner portion, and whether or not such angle or corner

526 is located "within the outer periphery of the flanges," it is difficult to determine. At some cross-sectional points on defendant's tire there appears to be an ill defined angle or corner, and at other points there are two such ill-defined angles or corners with a short radial line between them. In so far as I can locate these angles or corners they appear to vary on defendant's tire between a point substantially opposite the outer periphery of the flanges and a point slightly inwardly of the outer periphery of the flanges.

527 The final element of the claim is defined as "independent retaining wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges." Defendant's tire has independent retaining wires, but they do not pass entirely through the inner portions of the tire. They clearly intersect the line between the inner and outer portions, lying partly in the inner portion and partly in the outer portion. As regards the location of these wires relatively to the outer peripheries of the flanges, they appear to be just about tangent on their outer sides to a line drawn between and connecting the outer peripheries of the flanges.

528 While, therefore, I find in the exhibit of defendant's wheel and tire in evidence the three mechanical elements of claim 1 of the patent in suit, I do not find any or all of these elements possessing the limitations of structure and relative relation to each other as specified in the claim, and hence I do not find the alleged invention and device of the patent in suit as defined in claim 1 thereof to be present in the exhibits of the defendant's construction in evidence.

Referring to claim 2 of the patent in suit, this claim is also addressed to and covers a complete vehicle wheel, and the first element of the wheel structure, as recited therein, is "a metallic rim with outwardly projecting

flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides." This is a slightly more specific definition of the flanges than is contained in claim 1, and yet it is not entirely free from uncertainty and ambiguity. The flanges are defined as to location as "at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides." Obviously this definition applies with equal accuracy to a construction in which the flanges lean inwardly of the channel, as, for instance, in Fig. 8ª of the Willoughby British patent No. 5,924, of 1892. As to "outwardly projecting," the claim does not state whether the flanges project outwardly, relatively to the rim itself, or project outwardly relatively to the plane of the wheel. However, this definition of the flange is, in my judgment, equally inapplicable with the definition of claim 1 to the flanges of the defendant's structure, and would require the same modification to make it readable upon the defendant's structure as suggested in my discussion of claim 1.

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The definition of the second element of the claim,

> "a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges,"

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is substantially the same in substance and scope as the definition of the same element in claim 1, and does not apply to the defendant's structure for the reasons already stated in the comparison of claim 1.

The third element of the claim is "openings extending entirely through the unexposed portion of said tire." Strictly and technically speaking, an opening, having no material or tangible existence, does not, and cannot, constitute a mechanical element in a combination, but what

532 the claim means, evidently, is that the tire is provided in its unexposed portion with openings extending entirely therethrough, which feature is, of course, necessarily a feature of claim 1 also. I do not find that in the defendant's structure these openings (for the retaining wires) extend entirely through the unexposed portion of the tire, being located partly in the unexposed portion and partly in the exposed portion of the tire.

The fourth element, "independent retaining wires in said openings," and the fifth element, "a reinforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges," I find to be present in
533 the defendant's construction.

While, therefore, as regards claim 2 of the patent in suit, I find in the defendant's construction the three fundamental elements taken from the prior art on which the patentee Grant has built his alleged invention, I do not find in the defendant's construction the first, second and third elements of claim 2 of the patent in suit in the form and relative arrangement as defined in said claim, and hence I do not find in the defendant's construction the subject-matter of said claim, considered as an entirety.

534 Briefly summarizing my conclusions, for the reasons above given, I do not find the alleged inventions, combinations and devices of either of the claims of the Grant patent in suit embodied in or contained in either of the exhibits introduced in evidence professing to represent the defendant's tires.

Cross-Examination by Mr. Staley.

X-Q. 18. Please point out among the patents, publications and other devices prior to the Grant patent considered by you as having a bearing upon the scope of the

said patent or the invention therein claimed which you regard as the one most closely approximating the structure of the Grant patent, it being the purport of the question that for the present you will confine your answer to one single device. 535

A. I regard the British patent to Willoughby, No. 5924 of 1892, as representing, all things considered, the closest approximation to the patent in suit found in any single one of the prior art patents and publications which I have considered.

X-Q. 19. So far as you know is it not a fact that this patent has been considered by the experts and by the court in all the cases the records of which have been introduced in evidence herein? 536

A. Yes.

X-Q. 20. What patents or publications of prior devices have you considered in your testimony, if any, that have not been set up and considered in some of the various records which have been introduced in evidence in this case?

Recess for lunch.

A. None except the extract from the publication "The India Rubber World," which was set up in the Firestone case, but apparently not considered therein, so far as the record shows. 537

X-Q. 21. This Rubber World article, however, was offered in evidence by the defendant in the Firestone case and printed in the Record at pp. 288 and 289, was it not?

A. Yes.

X-Q. 22. So that your testimony is in effect a consideration of the evidence before the Court of Appeals in the Firestone case so far as it relates to devices prior to the Grant patent, with the result that you come to a different conclusion than that of the Court of Appeals as

538 expressed in their opinion in the Firestone case, is it not?

A. Yes; the reason why I have reached a different conclusion from that of the Court of Appeals, as I understand the ground on which said court found the letters patent in suit valid, being that I am unable to agree with the finding of the court on the question of the existence of the alleged tipping and reseating capacity of the Grant tire.

X-Q. 23. What practical knowledge have you—and by that I mean knowledge gained from personal practical experience—of the making and marketing of tires like the complainants' or defendant's?

539 A. I have visited the factory of the Firestone Tire & Rubber Company at Akron, Ohio, and have witnessed the manufacture there of the internal wire tire on which said company was used in the Firestone case. I have also witnessed the application of this tire to a wheel at the Chicago shop of the Firestone Tire & Rubber Company. As to the marketing of the tire, I have had no practical experience.

X-Q. 24. Have you visited the factory of the Diamond Rubber Company at Akron, Ohio?

A. No.

540 X-Q. 25. Is there any substantial difference between the Firestone tire involved in the Firestone case which you saw at the factory and at their branch in Chicago and the defendant's tire in this case?

A. Both were alike to the extent of the general shape of the tire and channel and the use of two internal retaining wires; but I do not recall all of the details of the Firestone tire with sufficient clearness and accuracy to state positively whether or not there was any substantial difference. I recall this, that the tires which I saw fitted at the Firestone shop in this city were made to and did "fit" the channel rim, whereas the defendant's tire in

evidence does not; and, further, I could not say from memory whether or not the retaining wires of the Firestone tire were located wholly within the inner unexposed portion of the tire. 541

X-Q. 26. Well, you do know, do you not, that all the tires that have been involved in the various litigation to which you have referred or as represented by the records which have been introduced herein, were substantially the same, and while they may differ somewhat in the exact angle of the flaring sides of the rim or the exact length of the outer or exposed side or in the relation of the exposed side to the unexposed side of the rubber portion of the tire, they were nevertheless substantially the same, both as to shape, size and construction? 542

A. Not having had the opportunity to examine the physical exhibits of the defendant's tires in the several suits referred to in question, and not being able to obtain a clear understanding of their construction from such references to them as I find in the printed records, I cannot affirm a knowledge one way or the other of the matter submitted by the question.

X-Q. 27. Have you any reason to doubt that if the finding of the Court of Appeals in the Firestone case as to the inherent qualities of complainants' tire as to its operation of adjusting itself to unusual shocks by the tipping and re-setting capacity, etc., is correct, that its finding that the same inherent qualities are found in the Firestone tire, is also correct? 543

A. Not being able to recall the structure of the Firestone tire as to all of its details, I cannot express a positive opinion; but if it is a fact that the wires in the Firestone tire corresponded in all respects to the wires and their relative location with the patent in suit, I should

544 have no reason to doubt the correctness of the finding of the court as to the Firestone tire.

X-Q. 28. Your answer is hardly satisfactory as it apparently assumes a different set of facts from those of the question. I asked you about the Firestone tire because what little practical experience, if such it may be called, you claim to have had with these tires was with the Firestone tire rather than with defendant's. Therefore, from this experience or observation of the making and applying of the Firestone tires, such as you have described, have you any reason to doubt the correctness of the court's opinion as to the inherent qualities and
545 operation of the Firestone tire being the same as in the patent in suit?

A. If I had before me the specimen of the Firestone tire that was before the court in the Firestone case I should be very glad to examine it and give you my definite opinion on the point inquired of. But any opinion I might now express would have to assume, in the first place, that the Firestone tires which I have seen were the same as the Firestone tire before the court; and, in the second place, that the retaining wires of the Firestone tires which I have seen were substantially similarly lo-
546 cated to the retaining wires of the Firestone tire before the court, as to which I have no distinct recollection. Hence, I cannot say that I have no reason either to doubt or affirm the opinion of the court as to the existence or non-existence of this tipping and re-seating capacity in the Firestone tire.

X-Q. 29. Assuming the correctness of the court's finding as to the operation of the Grant tire, do you doubt that the Firestone tire as you saw it produced at the factory and applied at the shop in Chicago, had the same operation?

A. Basing my opinion upon my best recollection of the

Firestone tire that I saw at the Firestone factory and shop, I have no reason to doubt it. 547

X-Q. 30. I think you have stated in your direct examination that you have seen and observed the operation of the Grant tires in use on vehicles in the streets. Were these tires which you observed in all cases the product of the complainant company's factories, or did you mean that you had observed this style of tire generally?

A. I did not know, or if I did at the several times when I have observed the conduct of these tires I have since forgotten, by whom they were made, so that my observation has simply been of this type of tire generally, irrespective of particular source of manufacture. 548

X-Q. 31. When did you visit the factory of the Firestone Company?

A. I have visited it on several occasions; but the time when I more particularly observed the manufacture of the internal two-wire tire was during the latter part of 1903.

X-Q. 32. And when did you visit the place of their application to the wheels located in Chicago?

A. I have also visited their Chicago shops a number of times, but the occasion when I particularly witnessed the application of these tires was on the 4th inst. 549

X-Q. 33. That was the day before you began your testimony, was it?

A. Yes.

X-Q. 34. Have you ever seen the defendant's tire applied?

A. No.

X-Q. 35. Then in giving your testimony as to the mode of application of these tires you have testified from your observation of the application of the Firestone tire; is that correct?

A. That is correct.

550 X-Q. 36. The rubber for these tires, as produced in the factory, is furnished in long lengths or rolls, and it is cut to the proper length and assembled on the wheels by the wires at the particular place or city where the tires are to be used, is it not?

A. I have been informed that such is the custom, and I have seen rubber tire stock manufactured in continuous lengths at the Firestone factory.

X-Q. 37. Do you know that the channels which are used on this style of tire are standard with the different makes of tire at the present time, and that the rubber furnished by the different factories may be applied to
551 the same channel, having regard to the sizes of the tires?

A. I do not know that.

X-Q. 38. Referring to "Complainant's Exhibit Defendant's Rubber Tire," I notice a wheel in the neighborhood of 4 feet in diameter, to which the tire is applied. Assuming this tire to be completed by the addition of the section which has been cut out of it, what would be the length of the rubber necessary to encircle this wheel, or in other words, the length of the periphery formed by the bottom portion of the channel, and I mean by that the seat of the tire?

552 A. Assuming that the diameter of the channel is 4 feet, the length of the tire to fit the channel seat would be approximately 3.141592 times 4, or 12.57 feet. I observe that in the application of these tires they are, in practice, cut slightly longer than the circumference of the base of the rim, so that the ends will come well together when the joint is completed.

X-Q. 39. Do you know what the average size of the wheels of horse-drawn vehicles is?

A. From observation I should state that they vary considerably, the exhibit of the defendant's wheel in evidence being nearly the maximum size used. I have seen

others that would not measure over 2½ or 3 feet in di- 553
ameter. I should say that they would average about 3½ feet in diameter.

X-Q. 40. Then the average length of the rubber forming the tire of these wheels would be somewhere around 10½ feet, would it not?

A. Yes.

X-Q. 41. What is the thickness of the rubber under the wires in defendant's tire?

A. A trifle under ¼ of an inch.

X-Q. 42. So that the rubber below the wires in this exhibit, "Complainants' Exhibit Defendant's Rubber Tire," would be equivalent to a sheet of rubber 12½ 554
feet long and about a quarter of an inch thick, which would be equivalent to a piece of rubber 3 feet long and an inch thick, or 1 foot long and 3 inches thick. Is this right?

A. That is approximately correct, considering volume alone.

X-Q. 43. What do you understand to be the characteristic of rubber as to its compressibility?

A. There are various kinds of rubber known in the arts such as raw caoutchouc, or unvulcanized rubber; ordinary vulcanized rubber, and what is known as "hard 555
rubber." Assuming that the question refers to rubber in the ordinary vulcanized form used for vehicle tires, such rubber possesses a considerable degree of compressibility, with a tendency to re-expand to its normal state when the compressing force is released. This rubber, however, if maintained for a considerable length of time in either a compressed or stretched condition, gradually loses its power of automatic return to its normal condition.

X-Q. 44. Is what you call raw rubber more or less compressible than the vulcanized rubber such as is used in these rubber tires?

A. It is more compressible.

556 X-Q. 45. Assuming a piece of rubber such as used in these rubber tires a foot long and 3 inches thick and enclosed within a receptacle in which it fits exactly upon all except one side, and you apply pressure equally to all points on this side, about how much would you say you can compress it?

A. Of course, the extent or amount of compression of such a piece of rubber would depend upon and doubtless bear a certain ratio to the amount of the compressing force. I assume, however, that the question means, what is the limit of compressibility of the rubber under an unlimited force. Judged solely by such observations and
557 experiments as I have made upon the compression of rubber, I should roughly estimate that it might be possible to compress it about 25 per cent. of its original thickness.

Adjourned till Tuesday, December 17, 1907, at 10 A. M.

Tuesday, December 17, 1907. Met pursuant to adjournment. Present, same as before.

X-Q. 46. You have stated that defendant's tire does not fit the channel. In what way does it not fit the chan-
558 nel?

A. Its base portion is considerably narrower than the interior of the channel, so that when the tire is in contact with the side flange on one side it is entirely out of contact with the side flange on the other side; or it may occupy an intermediate position in which it is out of contact with both side flanges.

X-Q. 47. How much smaller is the tire than the channel?

A. An eighth of an inch.

X-Q. 48. What is the purpose of making the tire narrower than the channel in defendant's tire?

A. I do not know.

X-Q. 49. Don't you think your measurement of an eighth of an inch as the difference between the channel and tire somewhat exaggerated? 559

A. One-eighth of an inch is about as near as I can make it.

X-Q. 50. This measurement you obtain by measuring the parts when the tire is lying loose in the channel, is it not?

A. I took the measurements with the tire pressed into the channel and against one side flange by hand. The tire is loose in the channel in the sense that it is not operatively secured thereon by the retaining wires, as in actual service. 560

X-Q. 51. Have you ever observed one of defendant's rubber-tired wheels after the tire was applied and ready for service and find that it did not fit the channel?

A. No, because all of the wheels I have observed equipped with this style of tire had the tire snugly fitting the channel. Whether any of them were the defendant's wheels or not I cannot say.

X-Q. 52. Then when you say that defendant's tire does not fit the channel you mean it does not fit it snugly, not that it is not the same general shape. Is that right?

A. I mean that the tire is not in substantial contact with all those parts of the rim that it apparently should contact with in order to fit the rim; not that the base of the tire does not have approximately the cross-sectional shape of the rim. 561

X-Q. 53. In other words, its a loose fit, not a snug fit. Is that right?

A. No, sir; it is no fit at all. I should hate to pay for a suit of clothes that did not "fit" me any better than the tire fits the rim in the complainants' exhibit of defendant's tire.

X-Q. 54. Well, as to the latter part of your answer,

562 that would depend on whether the style called for a tight fit or a loose fit, wouldn't it?

A. No, sir; a suit of clothes that was 9 per cent. too large for me, as this rim is too large for the tire, I should not regard as any fit at all.

X-Q. 55. While not accepting your figures as exactly correct, let us assume that in applying this tire the rubber strip which is to form the tire is cut 10 per cent. longer than the length of the circumference of the wheel rim, and that this 10 per cent. excess of tire is compressed or pushed back along the retaining wires until the tire or rubber strip which forms the tire is of a length equal to
563 the circumference of the wheel. What effect would you say that this would have on the diameter of the rubber tire and as to its fitting more snugly in the channel after this "compression"?

A. The internal diameter of the rubber tire would probably remain, under the influence of the retaining wires, equal to the diameter of the base or seat of the rim; and the rubber of the tire in transverse dimension would be slightly enlarged throughout the length of the tire, including the transverse horizontal dimension or width.

564 X-Q. 56. And this would have a tendency to make the tire if somewhat loose in the channel, more snugly fit the channel, would it not?

A. Yes.

X-Q. 57. I think you stated that you had observed that in applying these tires to vehicle wheels the tires were cut longer and an excess of rubber over the exact length of the circumference of the wheel was used. Do you not know that it is customary to make these rubber tire strips slightly less in cross-section of the base portion than the channel on the wheel, so that when this excess of rubber is upset along the wires or "compressed"

that the tire will fit the channel and not be croweded into 565
the channel under undue pressure, as might be the case if the rubber fitted snugly in the channel without this "upsetting" or "compressing"?

A. I do not know whether that is the custom or not. In the application of the tire to a rim which I observed at the branch of the Firestone Company in this city recently, the tire when first applied to the wheel had what might be called a loose fit, by which I mean that the base of the tire readily found its seat on the base of the rim, without requiring any radial pressure or compression, and the sides of the tire lay in easy contact with the flanges
of the rim, so far as I observed, and my understanding 566
of the main purpose of cutting the tire a few inches longer than the circumference of the rim has been to secure a close or snug radial joint at the meeting ends of the tire, which are cemented together, this being secured through the reaction of the tire to longitudinal compression to which it is previously subjected in welding the meeting ends of the retaining wires.

X-Q. 58. Did you also observe that after the tire was applied that the rubber portion fit the rim or channel more snugly than it did before in the Firestone tire?

A. I cannot say that there was any difference in this 567
respect perceptible to the eye, but I have no doubt that such was the case to a slight extent.

X-Q. 59. Did you make any measurements of the rubber and the channel of the Firestone tire?

A. I did not.

X-Q. 60. Well, you know, do you not, that without any "upsetting" of the rubber on the wire that the mere fact of bending the rubber from a straight strip into a circle to fit around the wheel rim, the rubber being held from movement on the wires, will of itself slightly compress and also slightly enlarge the base portion of the tire

568 in cross-section, due to the difference in diameter of the outer and inner circles representing the top and bottom of the rubber tire, as we understand those terms?

A. Yes, when the tire is bent its base portion represents the compression zone and its outer portion the tension zone, there being a plane lying between said zones which is neutral, and the longitudinal compression of the base tends to slightly enlarge the base in cross-section.

X-Q. 61. Then, whether the base portion of the rubber of defendant's tire fits snugly in the channel after it is assembled ready for use depends upon how much "upsetting" or "compressing" of the base takes place in the
569 operation of applying it, does it not?

A. I think not; because in my opinion there would not occur in practice anywhere near sufficient "upsetting" or "compression" of the base of the defendant's tire in applying it to the rim to make it fit snugly the latter, or even fit it at all within the commonly accepted meaning of that term.

X-Q. 62. But in expressing this opinion it is merely a theoretical one, based on no knowledge of the actual fact as to the amount of compression and consequent enlargement of the cross-section of defendant's tire in the appli-
570 cation of the same by the defendant, inasmuch as you never have seen the application of defendant's tire; is this not true?

A. It is true that I have never seen the application of defendant's tire, but my opinion is not based wholly on theory. By experiment with the "Section of Diamond Rubber Company Tire" introduced in evidence and calipering the base of the same when straight and when bent to a curve greater than that of the wheel from which it is taken, the variation in width is so small as to be almost imperceptible, not exceeding the width of a hair. It is my opinion that the increase of width of the base result-

ing from longitudinal compression of the tire when joining the ends would make no greater additional difference in the width of the base. It is not necessary that I should have witnessed the application of this tire in order that my opinion as to the amount of compression and consequent enlargement of the cross-section may be other than merely theoretical. 571

X-Q. 63. But whether or not this defendant's tire or rubber portion of the tire fits the channel when it is equipped ready for use is a question of fact which would be determined readily upon examination and measurement of a tire so equipped, as I understand it, and need not depend upon theory and opinion, and I think you have already testified that you have not observed defendant's tire when thus equipped on a wheel to determine whether it fits the channel or not; is this right? 572

A. That is true.

X-Q. 64. I think you have also testified that you do not know why the rubber of defendant's rubber-tired wheel is made smaller than the channel. What difference in function or operation, if any, do you claim results from making the rubber portion slightly smaller than the channel in which it is seated over the tire of the Firestone construction, for instance, with which you are familiar? 573

A. No difference of function would exist that I perceive, but the difference in operation would be that the tire would wobble or slide laterally in the channel under side thrusts met with in irregularities of the surface of the road, and would give the vehicle an objectionable side shake or wobble, such as is sometimes experienced when the nut on the axle gets loose, permitting longitudinal play of the hub of the wheel on the axle.

X-Q. 65. What would be the effect of having an opening on one side or the other between the rubber and channel as a result of the rubber being smaller than the chan-

574 nel in accumulating dirt and foreign substances passing over sandy or soft roads?

A. Of course, in passing over such roads, more or less dirt and foreign matter would tend to pack into the openings or crevices between the side or sides of the tire and the rim, and to such extent as such openings or crevices were thus filled the side play of the tire in its seat would be checked.

X-Q. 66. As I understand it, the existence of these side spaces or crevices, if they did exist, would be an objection rather than a benefit to rubber-tired wheels having them; is that your idea?

575 A. That is my view.

X-Q. 67. Would the tightening of the wires so as to compress the rubber under them have any effect in changing the cross-section of the base portion of the tire?

A. Yes, the pressure upon the rubber beneath the wires gives the rubber of the base a slight flow laterally.

X-Q. 68. The rubber under the wires when the wires have been united under the tension which you describe in your direct examination tends to expand and presses equally in all directions radially against these wires, which are in the form of rings, and which hold or confine this

576 rubber under tension; is that true?

A. Yes.

Recess for lunch.

X-Q. 69. Referring to your drawing, "Pond Drawing No. 1," do you consider it a necessity that the wire band which encircles the rim within the rubber should be bent as indicated in that sketch in order to accommodate a tipping movement or capacity of the tire?

A. I consider that the wire will bend, and must bend, substantially as indicated in dotted lines in the said drawing; in order to accommodate the tipping movement, if

any takes place, although the distinctness or sharpness of 577
the angle at the bend would vary with the extent of tipping movement. In a slight tipping movement the wire would bend relatively to its former condition, but without any pronounced or distinctive angle. In an excessive tipping movement, such as the drawings intended to represent, for the sake of clearness, there would be a somewhat blunt or rounded angle opposite the central point of the deflection of the tire.

X-Q. 70. Assume that the rubber portion of the tire which lies between the wire band and the bottom of the channel in the defendant's tire or as indicated in "Pond Drawing No. 1" were sufficiently soft or elastic to per- 578
mit the wire to be drawn into it or through it. Would it not be possible under those circumstances to pull this wire band to either side of the wheel for a considerable distance or to the extent indicated by the dotted lines in the figure without bending the wire at all?

A. Your question states the conditions so indefinitely that it is difficult to express an opinion thereon. I think perhaps we have different conceptions as to the meaning of the word "bend." If the rubber beneath the wire offered no resistance to the movement of the wire toward the base of the channel, the wire opposite the point of 579
thrust might move outwardly from the rim to a limited extent without any bending, and if the rubber offered a light resistance, the same might occur without any bending of the wire at a single point, producing a blunt angle, as indicated in the drawing; but nevertheless the deflected portion of the wire would bend in the sense and to the extent that it would assume a different degree of curvature from that which it normally possesses.

X-Q. 71. The point that I want to bring out is this: Assume that after the rubber is applied to the wheel in the usual way, all that portion of the tire above the wire

580 is removed and that the portion remaining and under the wires is very soft, pliable and elastic, and that the wires are stiff and not capable of bending. Would it not be possible under those circumstances to either push the wire rings from one side and cause them to raise at the other, or to pull them out from one side, the wires in either case embedding themselves in the rubber opposite to the point from which they extend or project from the rim?

A. Under the conditions cited in the question, which are the exact opposite of the conditions obtaining in practice, I see no reason why the action suggested by the question would not be possible.

581 X-Q. 72. So long as the pressure of the confined rubber is equal radially and outwardly against the wire bands as heretofore testified to by you, and so long as there is any elasticity of the rubber or in the rubber under the bands, then this action described in the previous question of moving the wire ring bodily so as to cause it to be closer to the center at one side and farther away at the other side, can take place, can it not, and without bending the wire?

A. It is physically possible that such a movement of the wire band or rim should take place without any bend-

582 ing of the wire, but whether it would or not would depend on a variety of conditions, such as the manner and location of the application of the disturbing force and the relative stiffness or pliability of the rubber and wires.

X-Q. 73. In referring to the Willoughby patent No. 5,924, as being the closest approximation to the Grant tire, did you have in mind any one of the particular structures, of which there seems to be quite a large number shown in the Willoughby patent?

A. I had in mind Figures 8[a] and 6, chiefly Figure 8[a].

X-Q. 74. The invention set forth in this patent, and as shown in all the figures, consists in securing the rubber

of the tire into place by retaining devices which embody springs or coils which are secured into the rubber by being pressed therein while the rubber is in a plastic state; is that right? 583

A. The question correctly states one of several methods of securing the coil in the rubber, as also one of several forms of retaining device disclosed in the patent. The patent also shows and describes (as in Fig. 3) a retaining wire having a short integral coil embodied therein to give it a degree of extensibility and longitudinal elasticity, and the patent also describes a manner of applying the tire and securing it, consisting in laying the rubber and coil combination round the wheel in the channel before the ends are united and forcibly drawing the ends of the coil or coils together and uniting them, without having to stretch the tire over the flanges of the channel rim. 584

X-Q. 75. There is no indication, however, from this patent of any means of fastening the tire in the way of wires or other fastening devices fastened to the rubber except those which embody one or more coils or springs to permit an elongation of this fastening device itself; is this not true?

A. That appears to be true. 585

X-Q. 76. And in each of the ten claims or statements of invention at the close of the specification is found mentioned directly or indirectly of the molding of the coiled or spring device into the rubber, is there not?

A. Yes, although claims 1 and 9 mention the coil as "either threaded through or molded in with the rubber," and the same is true by implication of claims 3, 5 and 7.

X-Q. 77. Referring to "Pond Drawing No. 2," how much of a load do you suppose it would take to bring defendant's tire into the position indicated in Figure 3, assuming the "Complainants' Exhibit Defendant's Tire" to

586 be one of the wheels of a four-wheeled cab; I mean how much of a load in the cab?

A. I could not attempt to give any figures on this, but I have at various times observed approximately the extent of radial diminution of these tires under load on a smooth surface, and it is my opinion that the extent of flattening of the tire indicated in Fig. 3 would occur only under a very heavy load, approximately the maximum that the springs of the vehicle would stand.

X-Q. 78. Referring to Figure 6 of this same drawing, what would be the effect if the left-hand wire should break under the conditions intended to be illustrated in
587 this figure of climbing a street car track?

A. The exposed portion or crown of the tire would flow even more over the flange on the opposite side, and the side of the base previously held down by the broken wire would yield somewhat away from the channel. The time element, however, is also a factor, and, in view of the fact that the point of contact of the side of the tire with the rail is constantly and more or less rapidly shifting, the extent to which the position of the tire, as shown in Fig. 6, would be modified by such an accident is somewhat difficult of determination.

588 X-Q. 79. If the side thrust should continue for any length of time to the extent that is intended to be illustrated in this Figure 6, would not the tire roll out of the channel if the wire on the side from which the thrust came were broken, or at least, roll over the side towards which it is being pressed by the rail or obstacle and turning around the wire which is not broken?

A. The tire would not roll out of the channel unless the other wire broke or tore through the tire, but the tire would undoubtedly tend to roll over the side toward which it is being pressed.

X-Q. 80. And if the rubber should tear through at the

other wire, then it would roll out of the channel, wouldn't it? 589

A. It might; that would depend upon the relation of the thrust to the load, and to some extent also upon the extent to which the other wire became disengaged from the tire. It will be likely to at least roll locally out of the channel.

X-Q. 81. Did you ever have any experience with the old solid bicycle tires to know how easily they would roll out of the channels in time on a side thrust?

A. I have, and I referred to such experience in my direct testimony, on page 65 of the present deposition.

X-Q. 82. Do you know anything about the characteristic of rubber to tear or break after it has once started? 590

A. Yes, I have observed that rubber tears and breaks quite easily after it has once started, especially if the torn or broken part be at all in a state of tension.

X-Q. 83. Did you ever have any experience with or opportunity to observe the operation of a tire having a fastening device, any part of which was in the nature of a spring; for instance, a coil like in Willoughby, or a serpentine wire, like in the Latta patent referred to?

A. Not that I can recall.

X-Q. 84. What would be the effect of threading through the rubber of the tire a fastening device like the Willoughby, having one or more coils and putting that tire into operation on a wheel; I mean the effect of the coil on the rubber and the effect of the large opening necessary to receive this coil in order to thread it through; what would be your opinion about that? 591

A. The relatively large opening necessary to receive the coil, where the latter has the increased diameter over the intermediate portions of the wire, would weaken the tire slightly.

X-Q. 85. Well, what would be the effect on a coil of

592 that kind of the constant rolling pressure subjected to the tire in use?

A. The coil would chafe and fray the rubber to some extent.

X-Q. 86. What would be the effect of the large opening in the rubber in that part where there was no coil, where the small part of the fastening device passed through?

A. There would be a slight flattening of these openings, but not sufficient to crack the rubber, in my judgment, as the openings are formed through the base portion of the tire that is confined laterally by the side
593 flanges.

X-Q. 87. Do you know what, if any other form of solid rubber vehicle tire the Diamond Rubber Company make, or how long they have been making the internal two-wire tire like the exhibit?

A. I do not know.

Adjourned till Wednesday, December 18, 1907, at 10 A. M.

Wednesday, December 18, 1907. Met pursuant to adjournment. Present, same as before.

594 X-Q. 88. In Figure 6 of the "Pond Drawing No. 2" I notice what appears to be an enlargement of the opening through which the left-hand wire passes in the rubber. Is this intended to represent the stretch of the rubber at that point occasioned by pulling the rubber against the wires?

A. It is.

X-Q. 89. This wire being under the pressure of the confined rubber lying between it and the channel, which pressure I understand from your direct examination, is almost equal to the breaking strain of the wire, and this pressure being equal radially against this wire or wire

ring, what, in your opinion, prevents this wire from breaking when this heavy strain as indicated in Figure 6 of this drawing is put on it? 595

A. I can readily conceive that the wire might break under an excessive strain. Three conditions may exist under a side strain, such as is illustrated in Fig. 6 of the drawing referred to. First, the strain may be not severe enough to either break the wire or disrupt the rubber; second, the strain may break the wire where the tensile strength of the latter is less than the cohesive strength of the portions of the rubber subjected to the strain; and third, the rubber may disrupt where its cohesive strength is less than the tensile strength of the wire. 596

X-Q. 90. I think you claim to base your opinion that this side of the tire including the wire cannot and does not lift under what is called the tipping theory, in part at least, upon some testimony which you claim to have found that the rubber breaks. Have you found anywhere in the record, or do you know of your own knowledge, that there is any noticeable breaking of the wires in the use of these tires?

A. I do not base my opinion as to the behavior of the tire under side thrust upon any testimony of others, and I have not claimed so to base my opinion; but I stated 597 that my views found confirmation in the testimony of a number of practical liverymen who testified in the suit of one of these complainants against the Firestone Victor Tire Company. Answering the latter part of your question, I have no personal knowledge as to the breaking of the wires from observation or experience, but I find in the record of the Goodyear case testimony to the effect that the wires break in service; for instance, in the deposition of Mr. H. S. Haase, page 69, answer to cross-question 34, and in the deposition of George Holtzmann, page 74 of the same record, answer to Q. 16.

598 X-Q. 91. Will you kindly read the answer of Mr. Haase that you referred to; also the answer of Mr. Holtzmann?

A. The answer of Mr. Haase is as follows:

> "A. I remember the circumstance, yes. That tire as I said, was entirely worn out, most all the way round. We have not found any of our tires leaving the wires up to this time, we have had wires broke."

The answer of Mr. Holtzmann is as follows:

> "A. The witness asks, 'whose tire is this?' I have put on a tire the same as this which they call
599 the American tire. The only difference between that tire and the Springfield tire was that the wire was brazed instead of welded and I also found that the brazing part of the wire would often occasion annoyance—the wires would break and I quit using them."

X-Q. 92. Suppose you take a piece of rubber an inch thick and three feet long and make it into a band around some solid substance and take a wire of the size of the one shown in "Complainants' Exhibit Defendant's Tire," and pass it around the outside of this band and apply force to the two ends of the wire so as to cause the encircling wire to be drawn against the rubber band all the
600 way round. Which would you say would reach its elastic limit first, the rubber or the wire?

A. The wire would break before the elastic limit of the rubber was reached.

X-Q. 93. Referring to the depositions alleged to have been taken in the Firestone Victor Rubber tire case from which you quoted, are you personally acquainted with either of the witnesses, or their business?

A. No.

X-Q. 94. Do you know any of them by reputation?

A. None, except Mr. Kimball.

X-Q. 95. I notice in the printed record of the Fire-

stone case, on pages 412 to 418, a deposition of Mr. 601
Charles F. Kimball, which deposition seems to have been taken from the Kokomo record by stipulation and made a part of the record in the Firestone case. Have you read that deposition?

A. I have.

X-Q. 96. I also call your attention to the deposition of Charles F. Kimball, pages 105 to 112 in the printed record of Goodyear case, and ask you if you have read that deposition?

A. I have.

X-Q. 97. Both of these depositions were taken two 602
to three years later than the deposition which you purport to quote from, were they not?

A. Mr. Kimball's deposition in the Firestone Victor case, from which I quoted, was taken November 10, 1898; his deposition in the Goodyear case was taken September 19, 1900, and his deposition in the Kokomo case was taken May 6, 1901.

X-Q. 98. I call your attention to Mr. Kimball's answer to cross-question 2, on page 108 in the Goodyear record, in reference to these internal two-wire tires; he says:

> "A. We guarantee them because in a business like ours, a high class business, we guarantee every- 603
> thing. In the past two years we have only replaced, I think, two wheels out of a thousand sets we have used."

In his deposition, page 414, in the Firestone record, where he testified in behalf of the defendant, I call attention to question 12 and his answer thereto, as follows:

> "Q. 12. To what extent, if at all, have the Kelley tires cut out at the side, or been otherwise disabled while in use?
> "A. I couldn't give the percentage—a few cases, of course."

Would you consider that this would indicate any con-

604 siderable breaking out of the wires through the rubber or breaking of the wires of these tires in use?

A. No.

X-Q. 99. What would be the effect, in your opinion, if in forming the rubber of one of these tires through imperfect action of the mold, or for other cause, the hole through which the wire is to pass should not be made round, but, owing to the unvulcanized rubber failing to run, there should be left an irregular opening having a sharp point or points. Would this have a tendency to make the rubber tear or break out from the opening more easily than it would from a perfectly round and
605 perfectly formed hole?

A. If I correctly understand the hypothetical structure suggested by the question, I think it would slightly increase the liability of the rubber to break at the hole.

X-Q. 100. And if the holes should not be uniformly spaced in the rubber, but should run out close to one side, or close to the bottom of the tire, would not the tire be more apt to give way at that point, and having once started, extend the rupture in use?

A. Yes, it would have that tendency.

Recess for lunch.

606 X-Q. 101. Figure 6 of the Willoughby patent, English, No. 5,924, of 1892, shows a pneumatic tire, does it not?

A. Yes.

X-Q. 102. How does this tire differ from that shown in the Brown & Stillman American patent No. 488,494?

A. They are practically alike, except that the fastening wires or bands of the Brown & Stillman patent are plain wires or bands, not involving the coil feature of the English patent.

X-Q. 103. This Brown & Stillman patent shows what

became known as the Dunlop pneumatic tire, does it not? 607

A. I think so, but I cannot say positively.

X-Q. 104. It was for the purpose of making a detachable pneumatic tire, the manner of detaching being to slip the wire ring over into a groove or depression in the felly, which groove would have a shorter periphery than the seat of the wire in use, and which is illustrated in Figure 1 of the patent, at the bottom; is that not right?

A. That is correct.

X-Q. 105. These pneumatic tires have quite a heavy internal pressure, caused by forcing air into the interior thereof, do they not?

A. They do, when properly inflated. 608

X-Q. 106. Pneumatic tires such as shown in the Brown & Stillman patent were quite successful and very extensively used, were they not?

A. Pneumatic tires generally have been, but I could not state as to the extent of use of that particular construction.

X-Q. 107. The idea of having a supplemental groove or an offset or shoulder in or on which the non-extensible wire ring or annulus was to be placed when the tire was inflated was to prevent the edges of the tire from raising, was it not, when in use? 609

A. The offset or shoulder undoubtedly serves the function indicated in the question, as well as seating and protecting the inner edges of the sides of the tire, and to a limited extent forming lateral supports for the sides of the tire.

X-Q. 108. And the purpose of the central groove or depression formed deeper than these offsets or supplemental grooves was to allow the wire or annulus to drop thereinto when the tire was deflated in order to remove the tire from the rim, was it not?

A. That is one of the functions of the central chan-

610 nel of the rim; another purpose served thereby being to provide for the expansion of the inner air-holding tube, besides which this channel produces a strong construction of rim by reason of its arch-shape in cross-section.

X-Q. 109. The primary object of the invention, however, was to make a pneumatic tire or what the inventors called a "high grade" pneumatic tire that could be "readily and easily detached from or applied to the rim of a wheel." And this object was accomplished by having the annular edges reinforced by these annular wires adapted to fit on the shoulders when the tire was inflated
611 and thus hold the edge of the tire securely to said rim; the reinforced tire edges being adapted to drop into the central groove when the tire was deflated to permit the tire to be detached. Is this not correct?

A. That appears to be correct.

X-Q. 110. Did you ever see or know of a pneumatic tire being marketed or used to any extent like that shown in figure 6 of the Willoughby English patent referred to, in which the retaining wires or annuli had springs in them to permit them to be extensible?

A. No.

612 X-Q. 111. If the rubber of the tire shown in figure 8[a] of the Willoughby English patent, No. 5,294, should be tilted up on one side so that the bottom of the tire should come to the edge of the channel, it would not re-seat itself.

A. I think it doubtful if it would re-seat itself in the cross-sectional form of channel shown in the said figure; but if the cross-sectional form of channel and tire-base shown for instance in Fig. 30 of the other Willoughby patent, No. 18,030 of this same year (1892) were substituted therefor, it would re-seat itself.

X-Q. 112. Figure 8[a] of the Willoughby patent No.

5,294, referred to shows a clincher channel, does it not? 613

A. It is somewhat on the order of a "clincher" channel, although it would not grip and hold the base of the tire with the same force and effect as a true clincher, such as is shown, for instance, in Fig. 5 of this same patent.

X-Q. 113. Did you ever have any experience with the clincher of type which was used quite extensively in England and to some extent in this country prior to the advent of the internal two-wire tire involved herein?

A. I have handled some patent business on tires of the clincher type, and I have examined these tires in practice, ridden on them, and observed the results of 614 practical tests thereof some years ago.

By Mr. Staley: Complainant's counsel now requests defendant's counsel to produce for use at this hearing the Kokomo record which was offered in evidence and stipulated herein, the same not having been up to this time produced.

By Mr. Offield: Defendant's counsel states that when he offered the record in evidence he supposed he had a printed copy of it in the office, but that the same cannot be found and is probably in New York where the injunction motion in this case 615 was tried first; that as the record was a printed copy of which the examining counsel for complainant was also counsel, and that it has been referred to in several if not all litigations, defendant's counsel would suggest that complainant's counsel temporarily refer to one of the copies that he probably has in his own possession, or that he refer to the copy of the record original now on file in the court across the street.

By Mr. Staley: Complainant's counsel has no desire to offer any technical objection to the records

616 not being produced, but that he has been assured from day to day that the records would be forthcoming. He further states that he has none of the printed records in his possession, and is therefore unable to refer to it, and that as the examination has continued during the time which he understands the clerk's office of the Court of Appeals is open, he has not had an opportunity to examine it there and even if he should examine it, it might not answer the purpose and the further cross-examination of the witness could not be here produced.

617 X-Q. 114. The Willoughby patent No. 18,030 to which you referred shows what is known as an armored tire in which links of metal are strung around the outer periphery of the wheel, does it not?

A. Yes.

Adjourned until tomorrow forenoon at 10 A. M., for complainant's counsel to visit the clerk's office of the U. S. Circuit Court both of Appeals and at the Circuit, to examine the record just identified by the last statements upon the record.

618 Thursday, December 19, 1907, met pursuant to adjournment. Present: Same as before.

X-Q. 115. Assuming "Pond Drawing No. 1" represents a wheel the size of "Complainant's Exhibit Defendant's Rubber Tire," what would be the distance around the wheel from the point marked 1 to the point marked 2?

A. About 11 feet, 4 inches.

X-Q. 116. Assume that the tire was raised as indicated in this drawing a quarter of an inch at the point farthest removed from the channel, what would be the compression or the amount to which the wire would be

drawn into this rubber in the 11 feet, 4 inches extending between the two points 1 and 2 to accomodate this quarter of an inch rise? 619

A. I have estimated this as closely as possible both by careful measurement and computation, and I find that the longer section of wire between the points 1 and 2, extending around the wheel, would sink into the rubber at all points an average of 1/200 of an inch, or 1/50, or 2 per cent, of the thickness of the rubber cushion underlying the wires.

X-Q. 117. Anything less than a quarter of an inch rise would make a proportionately less sinking of the wire between the same points, would it not? 620

A. Yes.

X-Q. 118. In one of your earlier answers you stated that in your opinion that rubber such as used in these tires when confined could be compressed about 25 per cent, and that raw rubber would have a greater degree of compressibility. Do you not know, as a matter of fact, that raw rubber or pure rubber has no compressibility, or, to be exact, about the same compressibility that water has, and that its elastic capacity comes from its ability to flow or move to different parts without disrupting its particles one from the other? 621

A. The term "compressibility" as applied to substances is used both in its strict technical or physical sense of a capacity for undergoing diminution of apparent volume under pressure, and a capacity for undergoing diminution of that dimension which is in line with the direction of the applied pressure. The former is, of course, the strict scientific meaning of the term, and the latter is a loose meaning, an outgrowth of popular usage. Both vulcanized rubber and raw rubber are compressible in both of these senses; but more pronouncedly in the latter or popular sense, which really relates more accur-

622 ately to the quality of elasticity, which latter is the capacity of a substance to undergo deformation under compressing, stretching, or twisting strains, and resume its normal form when the strains are relieved. The capacity of both vulcanized rubber and raw rubber in respect to compressibility in the strict scientific sense employed by physicists, namely, a diminution of apparent volume under pressure, is comparatively small; since this capacity inheres by virtue of the porosity of the substance, and the porosity of rubber in all forms is small, in the sense that the pores are extremely fine, considerably, although not perfectly, resisting the passage of
623 such fluids as air and water. In my answers to X-Q.'s 43, 44 and 45, I had in mind the more general and popular significance of the term "compressibility;" and in my answer to X-Q. 45 I possibly misunderstood the conditions of the question. The question itself does not make it clear whether the hypothetical box or receptacle was or was not closed at the ends, so as to entirely confine the rubber against the possibility of the exercise of its elastic quality; and in answering the question I had in mind such a receptacle as the channel rim forming in part the subject matter of the exhibit, so modified as to
624 confine the rubber on three of its four sides. If it was intended by the question that the rubber should be confined against yield or flow at the ends of the receptacle as well as the sides, then undoubtedly my estimate of its compressibility was excessive. Your question correctly states the cause of the elastic capacity of pure rubber; and as to the relative compressibility of pure rubber and vulcanized rubber, the compressibility of pure or raw rubber in the strict scientific sense is, I believe, slightly less than that of vulcanized rubber; while its compressibility in the popular sense of its elasticity or capability of deformation without disruption of the par-

ticles is, according to my observation, greater than that of vulcanized rubber. I cannot definitely compare the compressibility of pure rubber and that of water further than to say that the compressibility of both, in the strict sense of the term, is very slight. 625

X-Q. 119. How did you arrive at the result stated in your answer to X-Q. 116, that in raising a quarter of an inch as indicated in drawing No. 2, the wire would sink into the rubber at the points named a distance of 1/200 of an inch? Would it not be substantially in the same proportion that ¼ of an inch bears to 11 feet, 4 inches, or in the neighborhood of 1/500?

A. I first obtained geometrically the length of the raised portion of the wire 1 *d'* 2, and subtracting that from the total length of the wire I got the length of the longer section of the wire 1 2 extending nearly around the wheel. I then obtained geometrically, or by measurement of the angle 1 2, the length of the long section of wire 1 2 extending around the wheel as represented by the full lines in the normal holding position. From these I deduced the radii of the two circles represented by the full and dotted lines, respectively, and then simply took the difference of the length of these radii. Answering the latter part of the question, the proportion you suggest would not hold under the form assumed by the retaining wire in the tipping movement as exhibited in my drawing. 626 627

X-Q. 120. In your answer to X-Q. 89 as to your opinion as to why the wire would not break when under the strain indicated in Fig. 6 of your drawing No. 2, you gave several conditions which you assume might exist. Do you not think it is reasonable to suppose that the cushioning of the rubber under the wire under this 11 feet, 4 inches necessary to permit it to rise from the channel at a given point might have something to do

628 with preventing the wire from breaking under these heavy strains?

A. I can conceive how that might be possible if the wire were not originally applied under a tensile strain approximating its limit, which latter reduces the cushioning capacity of the rubber under the wire proportionally to the tension; but what you term the cushioning of the rubber under the wire is a force constantly imposing a powerful tensional strain on the wire, and hence any cushioning effect which it might have is at the expense of an increased strain. Hence, also, if the wire is normally stretched to nearly the tensile limit, and the
629 rubber under the wire is so compressed that any appreciable further compression could be had only under a strain exceeding the tensile limit of the wire, I do not see what difference it makes whether the material under the wire is capable of yielding or not.

X-Q. 121. To put it in another form, your idea is that a wire extending around over a cushion of rubber of some length would be just as likely to break under a given shock or strain as one which was resting on an unyielding substance. Is that right?

A. That is right under the conditions of my answer
630 to the preceding question, according to which the wire is under a tensile strain closely approximating its limit, and the so-called cushion is one which will yield only to the application of a force exceeding that at which the wire was originally stretched over it.

X-Q. 122. As a matter of fact, would the initial or constant tensile strain upon the wire have anything to do with the question as to whether it would break more readily under a given additional strain with the wire cushioned as indicated in my question in one case, or against a hard and unyielding substance in the other case?

A. If I correctly understand the question, I do not 631
see that it would.

Redirect Examination by Mr. Offield.

R-D. Q. 123. Have you read and examined the deposition of A. S. Krotz given in the Firestone case in this circuit, so that you understand the same and its purpose and intent, of the so-called test described in this testimony, and if so, please state whether or not you can reconcile yourself to the conclusions or even statements of alleged fact therein contained, and if not, in what respect do you consider the tests were unsatisfactory and insufficient to determine right questions intended. 632

By Mr. Staley: The question is objected to first as not proper redirect examination, being based upon matters foreign to the cross-examination; and is further objected to as irreleveant and immaterial.

A. I have carefully read the deposition of the witness, Mr. A. S. Krotz, referred to in the question, and I have carefully studied both the several forms of apparatus therein shown and described for carrying out the tests, and the photographic reproductions of the indicator cards. As I understand it, the purpose of these tests was to demonstrate through the agency of positive re- 633
cording mechanism, the existence of the tipping and re-seating capacity of the tire under side thrusts or strains thereupon. To my mind, the testimony as to these tests proves nothing as to the existence or non-existence of this tipping and re-seating capacity; and I will endeavor as briefly as possible to state my reasons for this conclusion.

In the first place, the conditions under which the tests took place are very incompletely described. I find no statement as to the absolute or relative loads carried by the vehicle during the different tests, except that in con-

634 nection with test No. 13 the vehicle was described as "partly loaded." I find no description of the specific character of the roads on which the tests were made, nor do the photographs in evidence afford any satisfactory information on this point, beyond the fact that there were some ugly car tracks in the road. I find no satisfactory description of the specific manners or modes of subjecting the tire to lateral strains. In connection with test No. 5 it is stated that "the horse was driven rapidly over the course and the cross street car tracks and gutters and against the curbing." In tests Nos. 7 and 8 it is stated that "the opposite wheel was driven against the
635 curb;" the same in connection with test No. 10. Test No. 11 was with an automobile, which was driven "over the track shown in photograph No. 3 and on a paved street, the vehicle being turned quickly and driven zigzag across the track." In test No. 13 the opposite wheel was driven "against the curbing a number of times." The manner in which the tire is affected by crossing car tracks at a sharp angle is well understood; but how any side thrust upon the tire is secured by driving either the wheel having the indicator device or the opposite wheel "against the curbing" is not apparent. Furthermore, it
636 is evident that the indicator would not be affected in any event unless that point on the tire at or near which the indicator was applied was itself subjected to the side strain; and as to whether or not this was the case I find no word of testimony in the entire deposition.

In the second place, the three forms of indicator devices which are shown and described in Figs. 1 and 2 of "Complainant's Exhibit 6, Sketch No. 1," Figs. 3 and 4 of the same exhibit; and Figs. 1 and 2 of "Complainant's Exhibit 6, Sketch No. 2" are crude and ill adapted to give accurate and reliable indications, principally because they involve a considerable degree of lost motion

in their movements and action. Furthermore, the devices shown in Figs. 1 and 2 of "Sketch No. 1" and in Figs 1 and 2 of "Sketch No. 2" give exaggerated or magnified records, as admitted by the complainant's expert, Mr. Joseph P. Livermore, in the concluding paragraph of his direct examination on page 102 of the record. 637

In the third place, it is admitted by the witness, Krotz, that tests Nos. 2 to 10 were made with a mutilated tire. On page 141 of the record the witness states that "Between test No. 2 and test No. 10 the tire had not been disturbed, *except to cut it and part it enough to make the needle connections to the wires.*" (Italics mine). 638

In the fourth place, the indicator cards or glasses themselves are confusing and inconsistent as to the stories they are supposed to tell. It is stated that in most of the tests the needle was swung idly over the glass sometimes before, sometimes after, and sometimes both before and after the test, to indicate a neutral position; and it is a curious fact that in all of tests Nos. 2, 3, 4, 5, 11, 12 and 13, in which the neutral line was made, the tests plainly showed a movement of the wire inwardly or toward the base of the channel, relatively to its normal position, as well as outwardly or from the base of the channel relatively to its normal position. 639 Apparently this puzzled the parties making the tests; and accordingly I find that test No. 6 was made, not by driving the vehicle, but by applying a clamp to the wheel directly over the point where the needle was fastened to the wire, and compressing the rubber against the channel, the needle being swung both before and after the clamping, and, as the witness testifies, showing a deflection of the wire toward the bottom of the channel of over 1/16 of an inch. This apparently explained the needle scratches below the neutral line on the other in-

640 dicator card hereinabove specified; this movement being the result of the pressure of the tire toward the bottom of the channel under the weight of the load each time the needle-carrying portion of the tire and wire was subjected to the load at the bottom point of the wheel. But another curious phenomenon is exhibited by the indicator glass of test No. 4. The witness states that the vehicle, during this test, was "driven carefully several blocks and return, during which time no effort was made to tip the rubber by driving over tracks or against the curbing. The distance covered was on a paved street, and before removing the glass the needle was again
641 swung in a horizontal position and the print No. 4 indicates this test." According to the theory of the complainant's witness making these tests, the scratches of the needle above the neutral line in Figs. 2, 3, 4, 5, 11, 12 and 13 indicate and are due to the rise of the wire away from the base of the channel under the side tipping of the tire; and yet this print No. 4 indicates proportionately fully as large an extent of rise of the wire from the base of the channel as do the other indicator cards referred to *under a test in which "no effort was made to tip the rubber" and the vehicle was "driven carefully."*

642 Recess for lunch.

In the fifth place, and as constituting perhaps the principal reason why I could not regard the results of these tests as conclusively proving the existence of the tipping and re-seating capacity in the Grant tire, the indications afforded by the tests are, in my judgment and for reasons which I shall hereinafter explain, referable to other causes than the tipping and re-seating action of the tire; and while I do not deny that if the tipping and reseating action takes place it might not produce some such indications as those shown, yet it is evident that if

these indications may be correctly referred to and ex- 643
plained by one or more other causes, the exclusive conclusion that they are referable to a single cause falls to the ground.

Test No. 1, not showing a neutral line, does not indicate the relative amounts of movement on opposite sides of the normal or neutral position of the wire. The extent of movement as shown by the glass appears quite large, relatively to the indications of the other tests; but this is partly due to the fact that the test was made on an old tire, and partly to the fact that the test was made with a mechanism which magnified the movement. 644
Tests 2, 3, 4, 5, 11, 12 and 13 all show movements of the wire both above and below the neutral line, the movement above the neutral line showing somewhat greater than the movement below, and varying more or less in the several indications. As I have already stated, it appears to be the theory of the witness who made the tests that the indications above the neutral line represented an outward movement of the wire under a tipping movement of the tire;—and this in the face of the indication of test No. 4 showing a pronounced mark above the neutral line when the vehicle was carefully driven without any effort to tip the rubber. 645

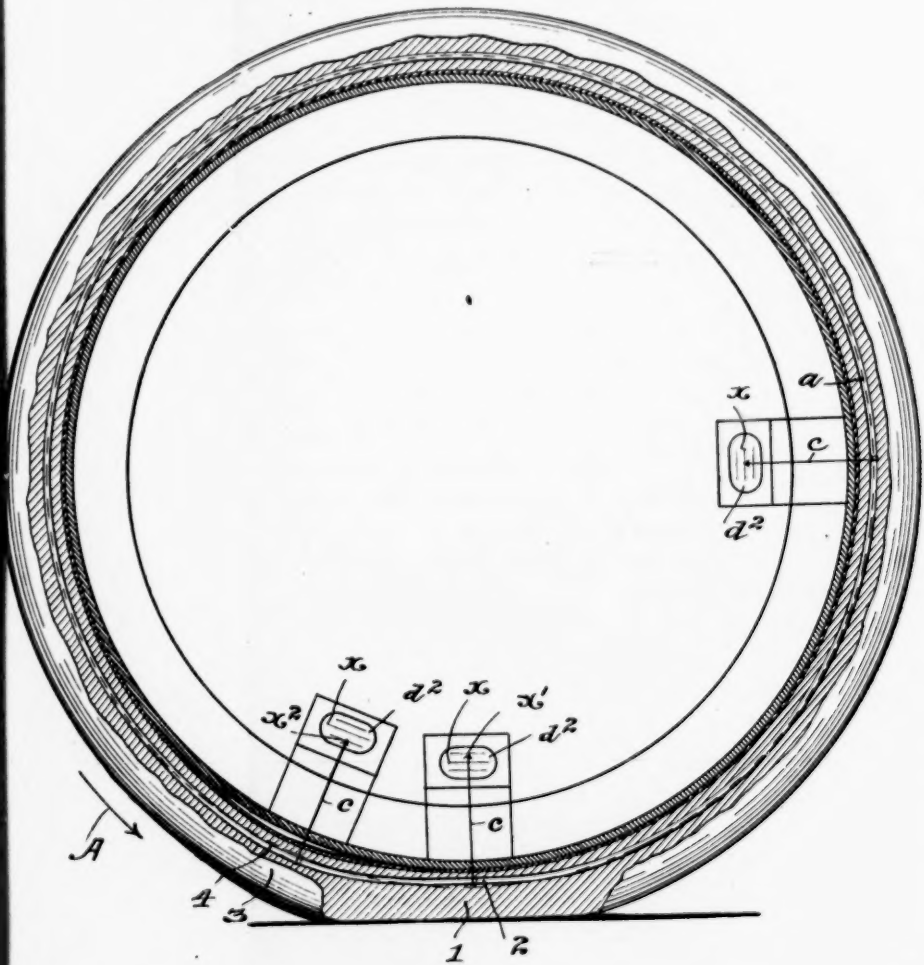
The clamp test No. 6 proved, according to the testimony of this witness, that under pressure, such as the load, the wires move inwardly; the test showing an inward movement of over 1/16 of an inch. I see no reason to doubt or question the accuracy of this particular test, and shall accept its results as substantially accurate. Now, a circular wire or hoop of elastic steel cannot be bent so that one point thereof moves toward the center without bulging the hoop at one or more other points of its circumference, so that such one or more other points will simultaneously move away from the center, or out-

646 wardly; and this is true whether the circle or hoop be naked or embedded in a rubber tire, as in the patent in suit. It thus follows that, in a construction such as is shown in the patent in suit, there exists in the normal travel of the wheel over the road a flat section of the retaining wires just above the point or surface of contact of the tire with the ground; and this means that at one or more other points the wires must rise or swell outwardly from their original or normal position to compensate for the inward movement of the flattened section or chord. It is a well known fact that in tires of the Grant construction the tires creep more or less
647 around the rim, and the wires creep more or less through the tires. The fact that the tire is applied under an endlong compression, which is quite considerable in some cases, so as to relieve the state of tension of the crown or tread portion and prevent it from gaping when cut accidentally, and the fact that the tire, at its point of contact with the ground, is compressed radially and partly flattened, produces in the tire a wave-like swell which is most pronounced just in advance of the point of contact with the ground; and this wave movement of the tire, together with the flattening of the wires co-
648 incidently with the point of flattening of the tire, produces a similar slight wave-like form and movement of the wire or wires continually in advance of the contact point. In order that this may be rendered more clear to the court I have had prepared a drawing illustrating the same, which I herewith submit.

By Mr. Offield: Complainant's counsel here offers in evidence the drawing referred to by the witness, and requests that the same be marked "Defendant's Exhibit, Pond Drawing No. 3."

By Mr. Staley: The drawing is objected to as immaterial and not proper redirect.

Defendant's Exhibit Pond Drawing No. 3.



In this drawing I have not made any attempt at mathematical or geometrical exactness, my purpose being merely illustrative, and consequently the parts are not necessarily in the same proportions in which they would be found on a full sized operative wheel. Taking the indicating mechanism shown on Figs. 3 and 4 of "Complainant's Exhibit 6, Sketch No. 1" of the Firestone record, page 138ª, the indicating needle and glass which I have diagrammatically illustrated in the drawing just introduced correspond to the needle *c* and glass d^2 of this mechanism, the needle being directly connected to one of the retaining wires *a*. On each glass d^2 I have drawn a line *x* intended to indicate the neutral position of the needle on the glass when the wire is in its normal position; and it will be seen that the needle points to the neutral position in the showing at the right hand side of the figure. At the bottom of the figure will be observed the compressed and flattened portion of the tire which I have marked 1, and therein the flattened portion or chord of the wire which I have marked 2. This flattening of the wire caused by its movement toward the base of the channel, as established by the witness Krotz, throws the point of the needle to a position *x'* corresponding to the limit of movement of the needle below the neutral line in the indicator glasses of the Firestone record. The swell or wave of the tire to which I have referred is shown at 3, and the corresponding swell or wave of the wire outwardly from its normal position is shown at 4. This draws the needle upwardly or outwardly relatively to the neutral line *x* to a position which I have marked x^2 in the indication at the left of the figure, and thus accounts for the indications above the neutral line on the indicator glasses of the Krotz tests to which I have referred. The wheel is assumed to be

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652 turning in the direction indicated by the arrow marked A.

So far as the tests numbered 7, 8, 9 and 10 are concerned, which tests were made with the apparatus shown on "Complainant's Exhibit 6, Sketch No. 2," page 140*a* of the Firestone record, it is evident that a relative depression of either retaining wire to the other, such as would occur where the wheel was rolling over a transversely slanting surface, bringing more pressure on one wire than on the other, or where the tire was under compression and simultaneously under lateral thrust, would rock or swing the needle under the magnifying action
653 of its actuating devices and produce the records shown on the indicator glasses of tests 7, 8, 9 and 10, without necessarily involving or being dependent upon any tipping and re-seating movement of the tire in the rim.

There is still another cause calculated to throw error into the indications of the apparatus in which the needle was connected directly to one of the retaining wires (which is the only apparatus that does not magnify, if not distort, the indications), and that is exhibited and testified to by the witness Krotz in connection with the indication of test No. 12, page 140*c* of the Firestone record,
654 and referred to at the bottom of page 141 and the top of page 142. I quote this testimony as follows:

> "The test on card No. 5 indicates a slight change of the horizontal line or neutral position, and the witness wishing to ascertain the cause parted the rubber where the needle is fastened to the wire and found that the wire had traveled during the test, bending the needle against the edge of the channel and lifting it. This movement of the wire no doubt occurred during the last test as the vehicle was driven harder and the test more severe."

A local thrust of the wire carrying the needle laterally toward the other wire, such as might occur in the case

of a loose fit of the tire in its channel or an unusually severe side thrust upon the tire, would also vary slightly the distance between the point of attachment of the needle to the wire and the neutral line on the indicator glass; in other words, it would slightly raise the point of the needle and introduce another element of error, so far as the indications of the rising and falling movement of the wire might be concerned. 655

For the foregoing reasons the tests to which I have referred, and the entire testimony of the witness claiming to have made the tests are far from convincing me that the tipping and reseating capacity of the tire necessarily follows from and is proved by such tests. Aside from the fact that there are too many elements of uncertainty and possible error inherent in the apparatuses with which the tests were conducted, the fact that the disclosed indications are, to my satisfaction, referable to other mechanical causes than the tipping and reseating of the tire, leads me to the conclusion that the said tests are of no practical value as establishing the conclusion sought to be proved by them. 656

SAMUEL N. POND.

No further cross-examination.

BY MR. STALEY: In view of the fact that the Kokomo record heretofore offered by defendant has not yet been produced, complainants counsel desires to withdraw that part of the stipulation which purports to identify said record as the printed record on which said case was heard. 657

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State of Illinois, County of Cook, ss.

I, Frederick C. Goodwin, a notary public in and for the county and state aforesaid, do hereby certify that the foregoing deposition of Samuel N. Pond was taken before me at the time and place therein specified, pursuant to notice hereto attached; that the parties to said case were present at the taking of the same, complainants by their counsel, Mr. Paul A. Staley, and defendant by its counsel, Mr. Charles K. Offield; that before deposing
659 the said witness was by me first duly sworn to tell the truth, the whole truth, and nothing but the truth in the cause now pending in the United States Circuit Court for the Southern District of New York, wherein the Consolidated Rubber Tire Company and the Rubber Tire Wheel Company are complainants, and the Diamond Rubber Company, of New York, is defendant; that said deposition was reduced to writing from the statements of said witness and the same duly subscribed and sworn to by him as therein appears.

And I further certify that I am neither attorney nor of
660 counsel for any of the parties in said deposition or caption named, and am in no wise interested in the result of said cause.

In witness whereof I have hereunto set my hand and notarial seal, this 19th day of December, A. D. 1907.

FREDERICK C. GOODWIN,
Notary Public.

[SEAL.]

661

UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, *Complainants,*
vs.
Diamond Rubber Company, of New York, *Defendant.*
} In Equity.

NOTICE.

662

To THOMAS W. BAKEWELL and
CHARLES W. STAPLETON,
Solicitors for Complainants.

Please take notice that upon Saturday, the 21st inst., viz., December 21, 1907, at 10 o'clock in the forenoon, at Rooms 701-702 Park Row Building, New York, N. Y., before John A. Shields, Standing Examiner and Clerk of the United States Circuit Court, we shall proceed to take testimony in the above entitled cause, in behalf of defendant, the witnesses to be examined being James W. Pitney, Samuel Lawson, William H. Seaech, Edward Francis Delaney, and others; such testimony to continue from day to day until completed.

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Your are invited to attend and cross-examine, if you so desire.

OFFIELD, TOWLE & LINTHICUM,
Solicitors and of Counsel for Defendant.

Service of the above notice acknowledged and accepted this ——— day of December, 1907.

.....,
Solicitors for Complainants.

664

UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, *Complainants*,
vs.
Diamond Rubber Company, of New York, *Defendant*.
} In Equity.

At the City, County and State of New York, this 21st day of December, 1907, at 11 o'clock A. M., at Room 701,
665 Park Row Building, in said city, before me, John A. Shields, a Standing Examiner of this court, personally appeared Border Bowman, Esq., on behalf of complainants, and Charles K. Offield, Esq., on behalf of the defendant, and thereupon the following proceedings were had, pursuant to notice hereto attached:

Defendant's counsel calls attention of complainants' counsel to the fact that there is present the printed record in the Court of Appeals of the United States Circuit, for the Seventh Circuit, of the Consolidated Rubber Tire Company, the Rubber Tire Wheel Company *et al vs.* The
666 Kokomo Rubber Company, offered in evidence in the taking of testimony at Chicago recently, but unable to be produced on account of the physical exhibit being in New York, and in relation to which complainants' counsel Mr. Staley, made the following statement upon the record:

> "In view of the fact that the Kokomo record heretofore offered by defendant has not yet been produced, complainants' counsel desires to withdraw that part of the stipulation which purports to identify such record as the printed record on which said case was heard."

And asks complainants' counsel whether he wishes this statement now to stand?

Complainants' counsel desires the statement to stand, 667
though he is willing to concede that the record now produced is the record referred to in the stipulation heretofore entered, and that same may be marked accordingly, but that the reason for Mr. Staley's objection was that he desired the record for use in cross-examination of the witness, Mr. Pond.

For the purpose of attempting, if possible to obviate the taking of extended testimony under the short time limitation of the court as to the putting in of defendant's testimony, defendant's counsel now asks complainants' counsel if he will admit certain facts that defendant's counsel understands can, without doubt, be proven as 668
relevant facts in this case, and will ask as to admissions of complainants' counsel as to these matters in numeral interrogation form:

First. Did not one of the complainants, The Rubber Tire Wheel Company, between the years 1894 and 1899 by its vice-president and superintendent Arthur W. Grant, the patentee of the patent in suit, apply or set the tires of the Grant patent in suit reinforced by the fabric strip as shown in the patent in the metallic channel or rim like the metallic channel or rim of the patent in suit, by cementing the lower portion of the tire seated in the rim 669
into the rim in addition to the retaining wires shown in the patent; to some extent, I mean, during those years?

Second. Did not the complainant during the same period of time draw the retaining wires loosely or with slight tension in holding the rubber tire to the rim, and during the same length of time did not this complainant have an inspector to examine and pass upon the tires as fastened in the rim by these retaining wires?

Third. Was it not one or two or several years after the date of the Grant patent before the complainant or complainants began fastening these retaining wires with

670 their utmost tension to hold the tires into, down upon the channel rim, or, in other words, to put on the tires as tightly as possible by tension upon the retaining wires?

Fourth. Did not the complainant, The Rubber Tire Wheel Company, between the years 1894 and 1899, while Grant was its superintendent, use brads or boards standing out from the channel and to prevent the tire from traveling or creeping provided the tire was not put on sufficiently or held sufficiently tight to the rim by the retaining wires; I mean, of course, the tire shown in the Grant patent?

671 Adjourned to 10 A. M., Monday, December 23, 1907.

NEW YORK, December 23, 1907.

Met pursuant to adjournment. Present, counsel as before.

Complainants' counsel, replying to interrogatory No. 1, admits that the record establishes the fact that Arthur W. Grant was vice-president and superintendent of The Rubber Tire Wheel Company during the period 1894 to 1899, and counsel is of the impression that Grant testified in the Goodyear or Kokomo cases; that some time prior to 1897 his company tried the use of cement, varnish or
672 shellac placed inside of the steel channel iron for preventing excessive creeping—somewhat for the same purpose as the anti-creeping device hereinafter explained; that such use of cement, varnish or shellac was soon abandoned as unsuccessful. Complainants' counsel knows that Grant did testify in some one of the many cases to the foregoing effect, and therefore admits the facts to be as stated.

As to interrogatories 2, 3 and 4, counsel for complainant admits that Grant testified to these matters as follows (Kokomo Record, pages 71-74):

"X-Q. 77. At one time the Rubber Tire Wheel

Company used on its tires made under your patent what was known as the anti-creeping device, being a plate of metal with projecting teeth placed between the channel iron and the bottom of the rubber—did it not? 673

"A. Only in an experimental way.

"X-Q. 78. But tires were sold for a while with these devices applied to them, were they not?

"A. They were with the expectation of making them right in case this creeping device should prove a failure instead of a success.

"X-Q. 79. What was the object of this anti-creeping device, that is to say, what trouble had arisen to cause your company to adopt it or try it?

"A. In some of the larger tires, that is to say, tires for heavy vehicles and especially so in vehicles propelled by steam or electricity, such as automobiles, and heavy vehicles, using brakes, we sometimes had trouble with the tire creeping or traveling lengthwise in the channel. But this was only in the heavier tires used on these kinds of vehicles and not always in those cases. 674

"X-Q. 80. And you finally overcame the trouble of creeping by making the retaining wires tighter than you had formerly done, did you not?

"A. Yes, in a certain sense. We caused the workmen to be more careful in putting the tires on uniformly as to tightness, which they had been somewhat careless in doing.

"X-Q. 82. And as a matter of fact, the later method did result in your company being able to have its wires tighter and more uniformly so than by the springing over method? 675

"A. I think we obtained more uniformity of tightness in the larger tires for heavy vehicles. Smaller tires for ordinary vehicles I can see no difference.

"X-Q. 83. And as a matter of fact, you did get the wires tighter by the later method, because by that method the men were enabled to do the work more uniformly; is this correct?

"A. I think that was correct.

"X-Q. 85. In regard to the tension upon the retaining wires by complainants in applying the Grant

676 tire, I will ask you if the matter of tension is not left to the judgment of the mechanics who do the work of applying the tire?

"A. To a great extent, but all tires or nearly all the tires are examined by some one competent to judge other than the mechanic putting them on."

Counsel further states that there was testimony to the same effect in the Goodyear Record, page 338, and complainants are willing to concede the accuracy of the foregoing testimony and are willing to abide by the same.

Defendant's counsel asks complainants' counsel if he will admit as bearing directly upon the interrogatories
677 just answered by coplainants' counsel that in the case of The Rubber Tire Wheel Company against the Columbia Pneumatic Wagon Wheel Company, pending some ten years ago in the United States Circuit Court for the Eastern District of New York, known in the records, I believe, as the American case, that the patentee Grant in that case testified as follows in answer to cross-interrogatories propounded to him as now quoted:

"X-Q. 52. Did you at any time change your method of putting on tires? If so, when?

"A. I can't say that we changed the method of putting on tires farther than to adopt a plan to put
678 on as tightly as possible, tighter than we usually did when first putting on these tires. That plan was adopted I think some time in the middle of last year.

"X-Q. 53. Do you mean by that that it was put into practice by the middle of last year?

"Objected to as irrelevant and immaterial inasmuch as the patent in suit does not relate to the particular method of supplying the tire, but to the mechanical construction.

"A. It was about one year ago that we decided that what trouble we were having with the tire was caused by it being put on too loosely. We at that time decided to put them on as tight as possible and from time to time watched this feature of the busi-

ness a great deal closer than before and I expect it would be said that we adopted it at that time." 679

Complainants' counsel is not able to admit such disjointed statements as having been made in the record of the American case, nor has he the means at hand for verifying the accuracy of the quotation, and in view of the many records already offered in this case, counsel is not prepared to further encumber the case by records of additional cases, but if counsel for defendant desires to introduce a certied copy of the deposition of A. W. Grant taken in the American case, counsel for complainants will not object to the offer of such a deposition.

680 Counsel, however, states that at the request of defendant's counsel that in the Firestone record, to wit, the case against the Firestone Tire and Rubber Company, a witness Krotz, called by complainants, testifying in December, 1905, as to the complainants' practice, said (page 137):

> "It was my custom to instruct the men to draw the wires as tight as possible; that the only limit or matter to be safeguarded against was the breaking of the wire."

Defendant's counsel states that he does not wish to introduce these old records in the old cases any further than possible or as now present, nor does he wish to make 681 the patentee Grant his own witness by introducing a certified copy of his deposition alone taken from another case, and asks complainants' counsel if he will permit this quotation above given to stand unless by investigation he finds an error therein, or that the same is modified by some other part of the deposition of the patentee that he may deem relevant to the quotation from the American case.

Complainants' counsel is unwilling to accept defendant's counsel suggestion, unless defendant will furnish

682 complainants' counsel with a copy of the American record, which complainants' counsel does not have at hand and does not know now of any way of verifying the same. If, however, defendant's counsel locates an American record, he will be willing to stipulate in the deposition, but he believes that it is wholly unfair for defendant to select disjointed parts of depositions, then ask complainants to go through the record and determine whether there is anything else in the record that would modify the statements.

Defendant's counsel states that he has not a copy of the American record, and by a diligent search through
683 the parties litigant, having knowledge of that record, he could not find that there is a copy extant; that the quotations put in the former interrogatory were made from the original deposition on file, and that he does not propose to go to the enormous expense of procuring a certified copy of the whole record upon a point or a quotation, as he understands it, which of necessity must be known by the complainants in this case.

Complainants' counsel insist upon their objection, but suggests that defendant produce a certified copy of the deposition.

684 Recess.

Adjourned to tomorrow, December 24th, at 11 A. M.

NEW YORK, December 24, 1907. 685

Met pursuant to adjournment. Present: Mr. Offield for defendant; Mr. C. W. Stapleton for complainants.

And thereupon defendant called as a witness on defendant's behalf—

THOMAS G. BRODERICK, who being duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield:

Q. 1. What is your name, age, residence and occupation.

A. Thomas G. Broderick; age, 56 last Sunday; resi- 686
dence, Middletown, Connecticut; occupation, carriage builder.

Counsel for complainants states that his life-long friend and former partner died about thirty minutes ago, and that he is suddenly called upon to assist for his funeral; but notwithstanding is unwilling to delay the proceedings, or ask for any delay; but asks defendant's counsel to consent that the testimony go on and that complainants' counsel have the right to interpose objections and cross-examine the witnesses should he deem it important to do so out of the regular order, and at any time during the afternoon of this day, as counsel feels that he must be absent during the early part of the examination because of the death before mentioned. 687

Defendant's counsel so consents.

Q. 2. Where is your place of business as carriage builder?

A. Middletown, Connecticut.

Q. 3. And how long have you been so engaged at that town?

A. For about fifteen years, and have been in business for myself about twelve years.

688. Q. 4. How long extensively have you personally carried on business during those years?

A. Probably ten or twelve thousand dollars a year.

Q. 5. When did you first personally have anything to do with the application of rubber tires to wheel vehicles of any description?

A. Why, I think about ten or eleven years ago; I couldn't tell just when we commenced on it, but we commenced very soon after we first put them on.

Q. 6. Please look at the tire shown in the Grant patent in suit and illustrated in the drawings of that patent, and state when you first became familiar with tires of this
689 description as shown in this patent.

A. I should judge it is about eleven years ago when we commenced to put on the Kelly tire; that was the first we put on.

Q. 7. That is the tire shown in the patent?

A. Yes, sir; it is. It was the first tire; we only put the channels on; we had to send our wheels to New Haven to have our tires put on—to have the Kelly tire put on.

Q. 8. About how long did this continue before you began putting on the tires yourself?

690 A. Well, the first tire we put on ourselves was the Morgan & Wright, the flat band tire.

Q. 9. But when did you first personally begin putting on these Kelly tires like the patent?

A. Why, I should think that was about eight years ago. It might not be quite as long as that, but that is as near as I can think now.

Q. 10. And prior to that time if you wanted a tire like the Grant patent, as I understand you, you had to send the whole wheel down to New Haven and have the tire put on there?

A. Yes, sir, and have the tire put on there.

Q. 11. When you first began putting on the Kelly tire of the patent how did you get the tire on? Just state what you did eight years ago. 691

A. Why, we had the Kelly machine, a regular machine for putting it on, and we brazed with gas instead of brazing with electricity, as Kelly did.

Q. 12. Well, please begin with the tire before you and with the two wires, and describe just what you did to complete the tire by fastening it in the metallic ring.

A. We had to string the wires through the two holes in the rubber, but we of course cut the tire off the right length first; and then we put it on the machine and drew it up, and cut the wires off, and spring back our rubber, what we want of it, to put the wires under it to draw it up with, and draw it together and braze it. Then put it on the other machine and draw the rubber together. 692

Q. 13. In what manner, with what kind of a machine, did you draw the two ends of the wire together to braze them, and how did you braze them?

A. Well, we had what is known as a Kelly brazing machine, and we brazed with gas.

Q. 14. Could you make a tight joint by this brazing between the two ends of the wires?

A. Oh, yes. 693

Q. 15. In straining these wires for fastening the rubber tire in the channel how tightly did you strain them?

A. Just as tight as we can draw them and not break the wire.

Q. 16. Why did you strain these wires to their utmost tension in locking the tire in the channel, without breaking the wires?

A. We draw them tight to keep the tire from creeping or lifting or getting out of the channel.

Q. 17. State whether or not you put the same degree

694 of tension upon both wires in fastening the tire in the channel.

A. Yes, both wires are drawn exactly alike.

Q. 18. Mr. Broderick, after you thus seat this rubber tire of the patent in the channel by these two retaining wires stretched to their utmost tension without breaking and then braze so as to lock and fasten the tire in the channel, please state whether or not that tire or that portion of it fastened by the wires to the channel ever moves by creeping or ever lifts from its contact and fastening by the wire to the bed of the channel by any kind of strain that comes upon it in any kind of use to which it is
695 subjected upon any kind of a vehicle.

Objected to as leading.

A. Not unless the wire breaks or something of that kind; never knew them to move unless the wire does break, provided both wires are drawn even; if they ain't drawn even it will draw the rubber to one side and allow it to roll out or break out.

Q. 19. Did you ever hear that when a tire like the Kelly tire shown by the patent was fastened in place in the channel rim by two wires each strained to their utmost tension without breaking to lock the tire in the rim
696 —did you ever hear or know or ever hear it claimed that such a tire had the capacity of tipping or adjusting itself or readjusting itself when such a tire was subjected to the severest lateral strain possible in the use of the tire on the vehicle in travel?

Objected to as leading.

A. No, sir; I never did.

Mr. C. D. Kerr appears for Mr. Stapleton at his request before Q. 18.

Q. 20. Mr. Broderick, when unusual and severe lateral strain is put with frequency upon these rubber tires so

fastened and anchored as you have described, what is the effect upon the tire, either as to wear or mutilation? 697

A. Why, tires will wear in different ways; some will wear off right square down to the channel, and there is times when they will break out at the side—tear out; and of course there is times when the wires will break. They don't all wear alike; you can put on a whole set of tires and they will all wear different; some will wear off flat before the others are half wore out. Of course the front tire will wear out first, because that gets the hardest service.

Q. 21. What would be the effect on the tire if the wires were put on loosely so that the tire could move, without actually being pulled out of the rim? 698

A. Why, the tire would naturally get to creeping in the channel; of course when you go around a corner or across the street-car track it would be more apt to pull it out of the channel altogether.

Q. 22. What would be the effect of the creeping of the tire on the wear or lifetime of the tire?

A. Why, it wouldn't wear a great while then; there would be wear on both sides of it. The wires would very soon cut that through then.

Q. 23. During the last eight years how many tires like the tires of this patent that you have described, approximately, have you put on at your place of business at Middletown? 699

A. Why, I should say in the neighborhood of fifty sets a year.

Q. 24. That would be 200 tires a year?

A. That would be 400 tires a year.

Q. 25. Is it part of your business also to take off old tires during that time?

A. Oh, yes: Take them off and examine them.

700 Q. 26. How large a place is Middletown?

A. It is 22,000, I think.

Q. 27. Have they the usual street and trolley car tracks there?

A. Yes, sir.

Q. 28. Can you state whether or not, Mr. Broderick, the tires which you put on your vehicles as you have described, receive as hard usage in Middletown as in any other part of the country in your knowledge?

A. Yes, sir; I think they get about the same treatment all over.

Q. 29. What is the size of these tires like the patent in
701 suit or the Kelly tire that you have personally put on and taken off during the last eight years?

A. The size of the tire, 7/8 to an inch and a quarter is what they run; we have some heavy coach tires that run about 2 inches, but not a great many of them.

Q. 30. Where do you get your channel rims which you used in the last eight years in which these tires are locked or fastened by these two retaining wires?

A. We buy it in different places; buy the majority of them from L. N. Ensworth, of Hartford. We have bought a good many of them from the Consolidated Rub-
702 ber Tire Company, the Kelly company.

Recess to 1:30 P. M.

After recess.

Present: Mr. Offield for defendant; Mr. Stapleton for complainants.

Cross-Examination by Mr. Stapleton.

X-Q. 31. Where is your place of business in Middletown, Mr. Broderick?

A. 129 Church street.

X-Q. 32. How did you happen to come here to testify?

A. Why, I was asked to come here, but I didn't know 703
what it was for or anything about it when I was asked to come here.

X-Q. 33. Who asked you?

A. Mr. Williams.

X-Q. 34. Who is Mr. Williams?

A. This gentleman right here.

X-Q. 35. Explain more fully if you know who Mr. Williams is.

A. Well, Mr. Williams, I have known him for a good many years, and I know he has been with the Diamond Rubber Company for a good many years; I don't know just how long. 704

X-Q. 36. Then you understand, do you, that Mr. Williams, who requested you to come here, is the representative of the Diamond Rubber Company, do you?

A. I expect so; yes, sir.

X-Q. 37. In your business in Middletown what make of tires do you handle mostly?

A. Well, we handle I guess more of the Kelly Springfield tire than any other tire.

X-Q. 38. Is that true of the past year as well as of other years?

A. No, we have handled the Springfield tire and some 705
of the Diamond tire.

X-Q. 39. Do you know who manufactures the Springfield tire?

A. I don't know who manufactures it.

X-Q. 40. Then from what point or from whom do you obtain them?

A. Well, for the last couple of years they have had an office at New Haven, called the Todd Rubber Company; previous to that we used to get them here in New York.

X-Q. 41. The Kelly Rubber Company?

A. The Kelly Rubber Company.

706 X-Q. 42. Being the plaintiff in this action?

A. Yes, I suppose it; I didn't know who it was when I came here.

X-Q. 43. You understand, do you not, that the plaintiff in this action is the Consolidated Rubber Tire Company and that it is sometimes known as the Kelly Company, and did you know that the Todd Company in Springfield, Mass., was an agency of the plaintiff?

A. I don't know of the Todd Company of Springfield. I didn't know there was a concern of that kind.

X-Q. 44. That is my mistake; I refer to the Todd Company of New Haven.

707 A. As I say, I didn't know who the suit was brought or anything; I didn't know what I was asked to come here for.

X-Q. 45. I don't think you quite understood my question. I ask you if you understand that the Todd Company at New Haven is the representative of the plaintiff, and that these tires that you have been getting from the Todd Company, New Haven, are in fact the complainants' tires?

A. I know that the Todd Rubber Company of course is agent for the Kelly Company tire, but of course as the 708 plaintiff in this suit, I didn't know anything about at all.

X-Q. 46. Well, you understand, do you not, that the Kelly Springfield tire, so called, is the tire in question in this suit?

A. Yes, I understand that now.

X-Q. 47. Your business, I suppose, is principally carriage building, Mr. Broderick?

A. Well, carriage and wagon building.

X-Q. 48. And the applying of rubber tires is merely an incident to that business, is it not?

A. Why, yes, in one sense of the word; we do all kinds of repairing in that line.

X-Q. 49. About how many carriages and wagons do you turn out in a year, Mr. Broderick? I mean new work. 709

A. Well, of course we buy and sell a good many that we don't build ourselves.

X-Q. 50. How many sets on the average have you applied during the past five years?

A. Why, it would be pretty hard to give a correct account of it here; I should say just about fifty sets a year.

X-Q. 51. Have you given the matter of applying these tires your personal attention, or has that been left to your workmen?

A. Well, I mean to look after all of them; I do look after all of them, but I don't put them all on. Unless there is something done while I am away, like today; somebody brings in a tire to repair it. 710

X-Q. 52. Then your average is about one set of tires a week, is it?

A. Why, take it through the year, yes; this time of the year we don't do much rubber tire business.

X-Q. 53. In applying the tires as you have described, do you draw them up in the channels tightly or loosely?

A. Just as tight as we can draw them without breaking the wire.

X-Q. 54. I suppose you have sometimes examined the tires after they have been applied to see if they were on tightly? 711

A. Yes, sir; I examine them all when I am there.

X-Q. 55. And you aim to get them on just as tightly as you can without breaking the wires; is that right?

A. That's right; yes, sir.

X-Q. 56. And is it your understanding that you can't get them on too tightly?

A. No, sir; you can't get them on too tight.

712 X-Q. 57. If applied loosely, is there a tendency for them to creep in the channels?

A. Yes, sir.

X-Q. 58. In what way do you examine them to ascertain whether or not they are on as tight as you can get them?

A. We get hold of the tire and spring down on the tire to see if we can move it in the channel.

X-Q. 59. That is, you press your thumbs on the sides of the tire to see if you can move it?

A. Yes, sir; to see if we can roll it.

713 X-Q. 60. And in making this pressure with your thumbs on the side of the tire to roll it, as you say, can you see the tire what I may describe as wink; that is, does it rise slightly under severe pressure of your thumbs?

A. It will if it is loose. But if it is put on tight, as it ought to be, you can't move it.

X-Q. 61. You can't raise it slightly with your thumbs, you think, if it is applied as tight as it ought to be?

A. No, sir; not so it will raise in the channel; you can spring the top of the rubber over, but it won't raise in the bottom.

714 X-Q. 62. If you applied double or three times the force to the side of the tire that you do with your thumbs, what would be the tendency?

A. The tendency I think would be to break the wire.

X-Q. 63. Would there also be a tendency for the wire to yield all around the circle and to raise slightly?

A. Well, I have never seen one that would raise when it was tight.

X-Q. 64. Well, it would be impossible to actually see the wire raise when it was applied to the wheel and when you were testing it with your thumbs, would it not?

A. Well, of course you couldn't see the wire raise be-

cause it is concealed; but I know you can't get a screw- 715
driver or chisel under it; you have got to cut the wire to get under the tire.

X-Q. 65. You don't mean to say, Mr. Broderick, do you, that it is impossible to insert a stiff screwdriver between the channel and the rubber and actually get it under the wire?

A. Yes, sir, without spoiling the rubber; you can put it under by cutting the rubber; but you have got to cut the rubber to do it.

X-Q. 66. When the tire is applied properly and completed, each of these retaining wires forms a complete 716
hoop or ring entirely encircling the wheel and resting firmly on a bed of rubber beneath it at all points?

A. Yes, sir.

X-Q. 67. So that underlying the wire or the wires, there is a mass of rubber at every point?

A. Yes.

X-Q. 68. That being so, if sufficient force were applied to lift the wire at any point, the yielding mass of rubber beneath it would admit of its being raised, would it not?

A. Well, the smaller amount of a chisel or screw- 717
driver that you would get in there wouldn't affect it but a very little; if the tire fits the channel properly it is just as tight on those flanges as it is under the tire almost as it is under the wires on the bottom.

X-Q. 69. In other words, the rubber is no denser or harder under the wires than it is on the sides or elsewhere, is it?

Defendant's counsel objects to the use of the word elsewhere in the question as manifestly misleading.

A. Well, of course you can't spring it underneath as much as you can on the side, because there is more rubber; there is more rubber to spring on the side of the wire

718 than there is under the wire, and there is no canvas on top.

X-Q. 70. What I am trying to get at is, whether in your judgment the mass of rubber lying beneath the wire is of the same density as the other parts of the tire?

Defendant's counsel objects to this style of interrogatories, because there cannot possibly be any "mass of rubber under the wire."

A. No; because under the wire is a lot of canvas; there is almost as much canvas as there is rubber.

X-Q. 71. Well, eliminate the canvas; how would it be with the rubber that does actually exist beneath the wire?

719 A. I don't know how that—I don't know how you could ever move it if the wire is tight.

X-Q. 72. Then I infer, Mr. Broderick, that you are not certain whether the rubber under compression hardens or is merely displaced?

A. Why, I don't quite understand you on that point.

X-Q. 73. Well, let me see if I can make myself understood. If you press down upon a piece of rubber, is it your idea that that rubber will become harder or more dense under pressure, or will it simply be displaced; that is, go elsewhere?

720 A. It will become harder; it will stay there.

X-Q. 74. Then you are not aware that rubber such as is used in rubber tires is practically non-compressible, and that it does not grow harder under pressure?

A. Well, the way I look at that you put a tire on and you spring back 8 or 9 inches into it, which we have to do to get enough rubber in, and if that wire breaks or anything you have got to repair that tire, and within a year or a year and a half you have got to put another piece of tire in there, because it won't spring back and the rubber won't be as long as when you put it in.

X-Q. 75. I understand that in applying tires you

cut the rubber tire some 6 or more inches longer than the circumference of the wheel? 721

A. Yes, sir.

X-Q. 76. And push or compress that extra length of rubber back so that when it is on the wheel it is just a complete circle and no more?

A. Yes, sir.

X-Q. 77. Now, in pressing that rubber back or compressing it, is it your idea that the rubber in the tire is made harder by that compression, or is it merely enlarged?

A. It grows harder in time and stays there, in constant use. 722

X-Q. 78. I am speaking of the time when it is first applied.

A. No; you put a tire on and take it right off again and the rubber will come back to its natural length.

X-Q. 79. But suppose you don't take it right off again, immediately after you have put it on, what becomes of this extra six inches or more of length; is that pulled back, so to speak, making the rubber tire somewhat larger, or is it compressed into the mass of rubber itself, thus making it harder; I merely inquire to know what your judgment is on this point? 723

A. It is certainly compressed into the tire; but of course, whether it will make it any harder I couldn't say, but I know it won't come back. I know if you try to cut a new tire and you cut an old tire, that it is a good deal harder to cut the old rubber than it is the new, because the old rubber is the hardest.

X-Q. 80. I suppose you have observed that in use all rubber tires, after a period of time, lose their life or elasticity and become, so to speak, dead?

A. Yes.

X-Q. 81. But when the tire is first applied, I under-

724 stand you to say, that there is underlying these wire rings, within the steel channel, some rubber?

A. Oh, yes.

X-Q. 82. Before you even get to the canvas on the bottom?

A. Yes.

X-Q. 83. And while the tire retains its life and elasticity that rubber like the other parts of the tire is yielding, is it not?

A. Yes, it is yielding, but the wire is drawed so tight there is no yielding to it; there ain't much to it because it is pressed down so hard on it.

725 X-Q. 84. What other experiments, if any, have you made to see in use or otherwise under pressure that the wires do not actually give or yield?

A. I don't know that I have made any experiments; just what comes in my work daily. I never tried that as an experiment, just as we practice it right along.

X-Q. 85. Do you mean that attempting to raise or roll the rubber with your thumbs is all the experiments you have made?

A. Why, that is something we have to experiment on every tire to see if it is right.

726 X-Q. 86. Well, is that all the experiments that you have made and all of the tests that you have applied?

A. Why, yes; I don't know any that we have tried, except trying to break the wire in prying it up.

X-Q. 87. Well, in what way have you tried to break the wire?

A. By trying to get a tool in under it to lift it up so as to break the wire.

X-Q. 88. Why did you try to get a tool under it to lift it up?

A. To take it off to repair it. Sometimes it is pretty hard to find a joint, after they have been run awhile.

X-Q. 89. Then, in certain cases where you desire to remove a tire you insert some tool under the wire to raise it up and break it; is that right? 727

A. We try to.

X-Q. 90. Do you succeed?

A. No; we have to take a chisel and find a joint and cut it.

X-Q. 91. Then you have never broken any wires by applying some tool beneath it to raise it up?

A. No, we have given up trying to do that; we take a chisel and cut it.

X-Q. 92. But at first, I assume, you did try to pry them up? 728

A. Yes, sir, thinking it was quicker.

X-Q. 93. Thinking it was quicker; did you ever succeed in getting a tool under the wire?

A. Not if both wires were right; if one was broke you might get under it; but if both wires was right you couldn't get under it.

X-Q. 94. My question is, did you ever succeed in getting a tool beneath the wire?

A. I say, no, not unless there was one wire broke, and then you could get under it.

X-Q. 95. But you have tried to do so? 729

A. We have tried lots of times, yes, sir.

X-Q. 96. Then, you don't know what effect the insertion of a tool beneath the wire and applying force to pry it up would have upon the wire from your actual experience?

A. I don't know, unless you spoil the tire; that's all.

X-Q. 97. Do you use or apply types or kinds of tires other than these Kelly Springfield tire?

A. Why, yes, we use the Hartford tire and the Diamond tire, the Goodyear tire; give them all a trial.

730 X-Q. 98. Well, the tires you have mentioned are all the same as the Kelly Springfield, are they not?

A. Yes, just about the same.

X-Q. 99. Are there any other solid rubber tires in the market except the Kelly Springfield type?

A. Why, no, not that I know of; they are all made in just about the same kind of mold.

X-Q. 100. Were you in business when these Kelly Springfield tires first came onto the market?

A. Yes, sir.

X-Q. 101. Do you know whether or not they supplanted and quickly drove out all other types of solid
731 rubber tires that were then being used?

A. Why, I don't know about driving them out, I don't know anything about that; I know we were buying tires all the times, the Morgan & Wright and the Hartford were on the market.

X-Q. 102. I don't think you quite understand my question. It is whether or not you have information as to older forms of rubber tire that were in use before the Kelly Springfield came into the field at all?

A. Why, the only one that I recollect of is the Goodridge.

732 X-Q. 103. That was a two-wire tire, just like the Kelly?

A. Yes, sir.

X-Q. 104. And what was the Hartford?

A. The Hartford was practically the same tire, except one wire instead of two.

X-Q. 105. What was the Goodridge?

A. Well, I suppose the Goodridge was about the same as the Kelly.

X-Q. 106. What became of the Hartford one-wire tire?

A. They discarded that and made a two-wire.

X-Q. 107. You understand, do you not, Mr. Broderick, that these Kelly Springfield tires, or tires of that type, that is, made like them when they first came onto the market, drove out all other forms of solid rubber tires? 733

A. Yes, I know they all quit the flat band and all other types of single wire.

X-Q. 108. Except like the Kelly tire?

A. Yes, that is the only tire there is now with two wires, the same as the tire in suit.

THOMAS G. BRODERICK.

734

Thereupon defendant calls as a witness in defendant's behalf FRANCIS A. LUDLAM, being first duly sworn, testified as follows in answer to interrogatories by Mr. C. K. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Francis A. Ludlam; age, 36; residence, Glen Cove, Long Island; occupation, general carriage and wagon shop.

Q. 2. How long have you been engaged in that business?

735

A. Seventeen years for myself.

Q. 3. At Glen Cove, during the whole of that time?

A. Yes, sir.

Q. 4. How large a place is Glen Cove?

A. About 9,000.

Q. 5. How extensive is your business, approximately?

A. What do you mean, how much business I do in a year, the amount of business?

Q. 6. Yes, generally as to amount of business and territory occupied by you?

A. I do about $50,000 a year. I have work come to

736 me from the surrounding country, I suppose ten or twelve miles, around there.

Q. 7. Are you familiar personally with the solid rubber tire put on wheeled vehicles like the tires and manner of putting them on shown in the drawings of the Grant patent in suit, which is now before you?

A. Yes, I am familiar with them.

Q. 8. How long have you been familiar personally and have put on that kind of tire in that manner shown in the patent, with two wires?

A. Somewhere about ten year; I couldn't say exactly.

737 Q. 9. How many tires of this kind have you put on wheeled vehicles, approximately, during that time?

A. Why, I should put on 1,500 set during that time; possibly more than that.

Q. 10. Four tires to a set?

A. Yes.

Q. 11. How many tires of this kind have you taken off, approximately, from wheeled vehicles, for one reason or another, during the last ten years?

A. I should say half that number, anyway.

Q. 12. During the last ten years how have you applied these two-wire tires like the tires of the patent to the

738 wheels or vehicles you have handled?

A. Do you mean what kind of a machine?

Q. 13. Yes, whether by hand or by machine, and how did you put the tires on?

A. We have a machine that grips the two wires, the wire continues through the rubber and around the wheels, passes over the tops of the points of the other wires, and winds upon two spools, each wire upon a spool of its own, and, of course, it is up so that each wire is at the right tension; just set the jaw up on the wire, then cut off the long ends, and braze the wire.

Q. 14. Do you mean you fasten the free ends of the

wire and hold the tire to the rim of the wheel or channel by brazing? 739

A. Just braze at the ends, yes.

Q. 15. How tight are these wires drawn in the channel to hold in the tire when they are brazed together?

A. Just as tight as we can draw them.

Q. 16. Do you mean just as tight as you can draw them without breaking the wire?

A. That's it.

Q. 17. Are these two wires drawn by the same machine and with the same tension when brazed?

A. Both wires? They should be.

Q. 18. Are they so intended by you? 740

A. Yes, sir.

Q. 19. Mr. Ludlam, after these two wires have been tightened to their utmost tension and the rubber tire locked and fastened in the channel rim by this action, is it possible by any lateral side thrust of the vehicle upon which said tires are fastened and the wheels of such vehicle, or is it possible in any of the known movements to which a wheeled vehicle is subjected to in travel, no matter how severe, to raise or unseat this tire so fastened in the channel rim by lifting the wires in the slightest degree? 741

Objected to, first, on the ground that it is grossly leading; second, that it calls for conclusions not within the knowledge of the witness; third, the witness has not been shown competent to testify as an expert, and it does not appear that the witness has made any experiments or has attempted seriously to investigate the effect of the force applied to the sides of the tires in question, and that the answer, whatever it may be, at most can be only speculative and the theory of this witness.

A. It can't be done, without the wire breaks.

742 Q. 20. State during the last ten years you have watched and examined these tires so locked and fastened by these tension wires into the channel rim under all conditions of severe travel and load?

A. I guess we have had every kind of a case put in front of me.

Q. 21. Have you personally during these years watched these tires in operation?

A. Yes, sir.

Q. 22. Would it be possible for one of these solid rubber tires to rise and fall in the channel rim in severe strains of travel, without you being able to see plainly
743 that they did rise and fall?

Objected to as leading.

A. Could not do it unless the wire broke, or slacked; the wire loose, or both.

Q. 23. Cannot you see any move of the rubber of any kind forming one of these tires by watching it in the travel of the vehicle?

A. Put my hand on it and tell right away.

Q. 24. In your own experience in the use of these solid rubber two-wire tires in the last ten years, and in the experience you have had by the taking off of these
744 tires from the wheel, where do you find the tires to be mutilated or destroyed in use?

A. Well, of course, always on the face, on the outside; with a few exceptions.

Q. 25. And the exceptions you speak of are where?

A. If a wire is slack they will creep and cut out on the side.

Q. 26. What has been your experience in the wire cutting through on the side of the tire?

A. They will do that, too.

Q. 27. During the last ten years have you noticed any

difference as to the wearing quality of the rubber of 745
these solid rubber two-wire tires?

A. No, I don't think that I have, much.

Q. 28. Do you mean by that that certain tires do not wear better than others?

A. Well, all good makes are just about the same.

Q. 29. And the poor rubber wears out?

A. Wear out quicker, always.

Q. 30. During the last ten years what experience have you had, or what have you noticed, as to these solid two-wire tires like the tires of the Grant patent before you, being fastened to the rim otherwise than by the tension retaining wires? 746

A. I don't quite understand your question.

Q. 31. What I mean is, that during these last ten years have you found these solid rubber tires to be cemented into the rims or channels in addition to the retaining wires?

A. Yes.

Q. 32. To what extent have you found these two-wire solid rubber tires like the Grant patent before you, cemented to the channel rim?

A. I have found a few that way.

Q. 33. Have you ever followed his practice of cement- 747
ing the solid rubber tires to the rim in addition to the retaining wires?

A. I did in the early years.

Q. 34. Did you ever find that these solid rubber tires cemented to the channel rim as shown in this Grant patent and held in position by the retaining wires, as you have described, to be lifted or broken loose from their channel bed in travel?

A. No.

Q. 35. Who made the tension machine that you use?

A. I can't tell you. It is one of the earlier ones.

748 Q. 36. Can you put tension enough on the wires by your machine to break them?

A. Break any of them.

Q. 37. What size of rubber tires do you usually put on in your business during the last ten years?

A. From 7/8 to 2-inch.

Q. 38. Any considerable portion of them 2-inch?

A. No; most of them 7/8 to 1¼.

Q. 39. How do the country roads in your vicinity, upon which your vehicles travel, as I understand, compare as to severity upon the tire with city use or travel?

A. They have the hardest kind of test.

749

Cross-Examination by Mr. Stapleton.

X-Q. 40. Where are you buying your rubber tires now?

A. I have got all leading makes in stock—about all leading makes in stock.

X-Q. 41. Please answer my question. Where are you buying now?

A. Morgan & Wright, Kelly Springfield, Diamond, Goodyear, Goodrich; I guess that is all I have in stock.

X-Q. 42. How long since you have purchased from
750 the Consolidated Rubber Tire Company?

A. I don't think I have bought any of any tire in three or four months.

X-Q. 43. How long since you have bought tires from the Diamond Rubber Company, the defendant?

A. I have been buying them for ten years.

X-Q. 44. Where have you done the principal part of buying your tires during the last year or two?

A. I think I have used the most Diamond.

X-Q. 45. You are a large customer of the Diamond Company, are you not?

A. Yes, I have bought a large number from the Dia- 751
mond people.

X-Q. 46. Were you requested to come here and testify by Mr. Williams, of the Diamond Rubber Company?

A. No.

X-Q. 47. By whom were you so requested?

A. Well, I couldn't say; one of the men in the Diamond Rubber Company requested me.

X-Q. 48. As to what?

A. If I would come in at 9:30 this morning, over the 'phone.

X-Q. 49. Did he tell you what for?

A. No. 752

X-Q. 50. Did you know what for?

A. No, I did not.

X-Q. 51. Do you buy for cash, or on credit, mostly?

A. Mostly cash; that is, what we call cash limit of thirty days.

X-Q. 52. I understand you to say that in your early experience you ran across a few sets of tires of this two-wire type that had been cemented in the channel, and that you cemented in a few yourself?

A. Yes.

X-Q. 53. Have you any knowledge as to who ce- 753
mented in those that you observed, other than those you cemented in?

A. No, I do not; only in the repair work; they were well worn down, and you couldn't tell where it might have been.

X-Q. 54. Why did you abandon the cementing of the tires?

A. I found it would hold them just as well with the wire.

X-Q. 55. How many sets did you cement in?

A. Why it is hard to say; I should say fifty.

754 X-Q. 56. That was largely before you drew the wires up in the channel by the machine?

A. I have always had this machine ever since I put on tires, put them on with that same machine.

X-Q. 57. Then you did not apply tires when the ends of the wires were united before the tire was placed in the channel and then sprung over the flange?

A. Didn't do it myself.

X-Q. 58. What kind of cement did you use when you cemented them in?

A. I don't know what kind it was, some that was furnished me, which I had to buy.

755 X-Q. 59. Did that cement always hold tight, or did it sometimes break up?

A. Always held them.

X-Q. 60. Ever find that the tires cut out on the side?

A. Yes.

X-Q. 61. Was that true of those that were cemented in?

A. I find them cut out to-day, and we don't cement them now.

X-Q. 62. How long ago did you abandon the cementing process?

756 A. I don't believe I done it only the first year; might have the second year, I wouldn't say.

X-Q. 63. Then you abandoned the cementing some eight or nine years ago?

A. I should say something like that.

X-Q. 64. What was the object of applying the retaining wires if the cement would do the work and hold the tires in place?

A. I never applied them with cement alone, I always used the wires as well.

X-Q. 65. Is it your idea that the cement alone would have been sufficient to hold the tire in the channel?

A. I have seen tires after the wires came out stay 757
in the channel and run.

X-Q. 66. Do you understand my last question?

A. Yes, sir; I am answering it that way.

X-Q. 67. Well, I'll repeat it so that there shall be no mistake. Is it your opinion that the cement alone would be sufficient to hold the tires in place in use; this calls for your opinion, and not what you have seen?

A. I think the wire should be there.

X-Q. 68. Then, I assume that it is your judgment that the cement alone would not be sufficient; is that correct?

A. That's right.

X-Q. 69. You may describe the tests that you have 758
made to ascertain whether or not in actual use these two-wire tires applied in the usual way, without cement, do or do not rise in the channel and reseat themselves?

A. They can't rise and go back unless the wire bursts or slacks.

X-Q. 70. Do you understand the last question?

A. Well, I think I do. I tried to answer it that way.

X-Q. 71. Then, if you understand the question, please describe the tests that you have made, if any.

A. Well, we have tried to lift them out of the chan- 759
nel by putting something under them and prying them up.

X-Q. 72. Is that all the tests you have made?

A. Oh, we try in various ways to roll them out.

X-Q. 73. What ways?

A. By putting something under them, and rolling them out with the hands.

X-Q. 74. Well, have you made any other tests beside putting something under them and trying to roll them out with your hands?

A. No.

760 X-Q. 75. But what have you tried to put under them?

A. A flat tool, flat chisel.

X-Q. 76. Were these tests made upon new tires or old tires?

A. Both.

X-Q. 77. Where were they made?

A. In my shop.

X-Q. 78. And you made no tests elsewhere than at your shop; is that correct?

A. That is correct.

X-Q. 79. Then it is true, is it not, that in actual use you cannot say of your own experience what the effect of
761 running a rubber tire against a curbstone or other lateral obstruction has upon the tire?

A. I have had experience. I have always run one myself.

X-Q. 80. Well, describe more particularly what, if anything, you have noticed.

A. About running it against a curbstone?

X-Q. 81. Yes.

A. Well, you will cut your tire if you run it against the curbstone hard enough.

X-Q. 82. Running tires against curbstones and twist-
762 ing them around through car tracks, has a tendency to push the tire over, does it not, opposite to the line of thrust?

A. Yes.

X-Q. 83. That has a tendency, does it not, to make a strain on the wire that holds the tire in place?

A. Yes.

X-Q. 84. Well, is rubber, in your judgment, a yielding or an unyielding mass?

A. It is yielding.

X-Q. 85. Is it compressible or non-compressible, in your judgment?

A. Compressible.

X-Q. 86. That is, you think it can be squeezed into itself? 763

A. Yes.

X-Q. 87. When these two-wire tires are applied, these retaining wires constitute two independent rings or hoops located entirely within the rubber, do they not?

A. Yes, sir.

X-Q. 88. And a portion of the rubber tire lies between the bottom of the wire and the steel channel, does it not?

A. Yes, sir.

X-Q. 89. Is that portion of rubber which lies immediately between the wire as hard or harder, in your judgment, when the tire is applied than the other portions of the tire? 764

A. I think it is harder.

X-Q. 90. Is it so hard, in your judgment, that it is entirely unyielding?

A. No.

X-Q. 91. Then, if force enough were applied at any point to raise the retaining wire, this underlying rubber would yield to some extent, would it not?

A. It will.

X-Q. 92. In other words, this underlying rubber is not a solid mass, and if force enough is applied to the retaining wire on its under side, the wire will ultimately break? 765

A. Yes, if you put power enough on it.

X-Q. 93. But before breaking, is it your understanding that there would be some yielding?

A. Yes, and the tire would tear, too.

X-Q. 94. I don't suppose you claim, Mr. Ludlam, that the eye can actually detect whether or not a tire in actual use does rise or fall to any extent?

A. You can't see it going over the road, but if you put your hand on you can tell.

766 X-Q. 95. When do you mean you put your hand on it?

A. When it stops and you put your hand on it you can tell whether it moves or creeps.

X-Q. 96. Do you mean that by putting your hand upon the tire that you can tell whether it has moved or crept?

A. Yes, or whether it is doing it at that time, and if it has moved any it will continue to, and grow worse.

X-Q. 97. And that, I suppose, you mean to apply to creeping more particularly?

A. Yes.

767 X-Q. 98. I suppose in your experience you have tried to lift the tire with your thumbs in order to test them?

A. Yes, sir.

X-Q. 99. And sometimes you find them loose enough so they will rise, I suppose?

A. Just roll a little, I have found them.

X-Q. 100. And at other times pretty tight, so that there is no giving of the wire?

A. That is it.

X-Q. 101. Take the case of an inch and three-quarter tire, say, on a hansom cab wheel, if force enough were
768 applied at any given point, say, six inches in length, to rock the tire, what particular parts of the tire would be affected by that rocking motion?

A. About six inches, where you had hold of it?

X-Q. 102. That would be thrust over opposite to the line of force applied, would it not?

A. Yes, it would be torn if the force was hard enough.

X-Q. 103. Torn if the force were great enough; is that it?

A. Yes.

X-Q. 104. Now, assume that the force applied—or rather, assume that this rubber was strong enough to

withstand the force which was applied without tearing, what would be the effect? 769

A. Break the wire.

X-Q. 105. And before the wire broke, I suppose there would be more or less yielding of the wire, would there not?

A. I don't think there is any yield to this hard wire; the wire would break before it would yield.

X-Q. 106. Do you think the tension on the wire, when properly applied, is the very utmost that it can stand, so that the least additional strain would break it?

A. No. I think it would stand more strain than that.

X-Q. 107. Then, if it would ordinarily stand some degree of strain, it would have a tendency, I suppose, to squeeze still tighter and harder onto the mass or portion of rubber which lies beneath it adjacent to the part when the strain is applied? 770

A. That's it.

X-Q. 108. In other words, the underlying mass of rubber is not of sufficient hardness so but that this wire will or may yield and raise somewhat if sufficient force is applied; is that correct?

A. Yes, it will raise a little.

FRANCIS A. LUDLAM. 771

Adjourned to Thursday, December 26, 1907, at 10:30 A. M.

New York, December 26, 1907. Met pursuant to adjournment.

Adjourned to 2 P. M.

Adjourned to to-morrow, December 27, 1907, at 11 A. M.

New York, December 27, 1907. Met pursuant to adjournment.

Adjourned to December 28, 1907, at 2 P. M.

772 New York, December 28, 1907. Met pursuant to adjournment.

Present: Mr. Stapleton, for complainants; Mr. Offield for defendant.

And thereupon defendant calls as a witness in defendant's behalf OMAIRE J. DUHAMEL, who, being duly sworn, testified as follows, in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation?

773 A. Omaire J. Duhamel; age, 33; residence, in Brooklyn; occupation, carriage builder.

Q. 2. How long have you been engaged in that occupation in Brooklyn?

A. Seventeen years.

Q. 3. How does your business as carriage builder compare with your competitors in Brooklyn, both as to value of your carriage output and the excellence of your workmanship?

Objected to as immaterial.

A. It is as good as any in Brooklyn.

Q. 4. Is it any part of your business as a carriage
774 builder or dealer or handler in carriages to equip the vehicles originally with solid rubber tires like those shown in the Grant patent in suit, now before you?

A. Yes, sir.

Q. 5. When did you first begin putting such tires on wheeled vehicles?

A. About the year 1904.

Q. 6. How extensively have you used and applied such tires each year since that date?

A. About a hundred set a year.

Q. 7. Do you mean by a set four tires to a set?

A. Yes, four tires to a set.

Q. 8. Have you had any trouble with the tires of this patent being destroyed in any way before they were worn out as to their tread or working surface in actual use, and if so, in what manner? 775

A. We have quite a good deal of trouble with the tires cutting through the base.

Q. 9. How about the sides?

A. Once in a while through the sides.

Q. 10. Do you personally apply these Grant tires to your carriages, and if so, state in what manner?

A. Well, we don't apply them now, but we have been applying them.

Q. 11. Well, when you personally applied them, how did you do it? 776

A. We brazed the two wires and slipped the wires on over the channels.

Q. 12. Do you mean the wires running through the holes in the tires?

A. Through the holes, of course.

Q. 13. Did you ever apply the tires by drawing the wires by mechanical means up into the channel—I mean the solid tires of the Grant patent?

A. We never drew the wires, we pushed the wires through the holes.

777

Q. 14. But when you wanted to apply the tire with the two wires pushed through the holes into the channel or rim of the wheel, how did you do it?

A. We used a machine for pulling them onto the wheel.

Q. 15. How powerful was that machine, and how tight was the wire stretched by the machine to hold the solid rubber tire in the channel?

A. The machine was that powerful that we could draw the wires tight enough to break them.

Q. 16. After these wires were thus drawn with such

778 tension by your machine, how did you fasten the ends together in the channel?

A. They were scarfed and brazed.

Q. 17. Ever weld them electrically?

A. No, sir.

Q. 18. Mr. Duhamel, after these Grant solid rubber tires were fastened in position in the channel by stretching the two wires to their utmost tension by the machine and then brazing them, did those tires rise or fall in any way or to any extent, or could they rise and fall in the channel by any travel to which the vehicle was subjected, lateral thrust of wheels or any of the severe
779 movements to which the vehicle would be subjected in travel?

A. No, sir.

Q. 19. What kind of vehicle do you usually use or build in your business?

A. Coaches, hearses and undertakers' wagons.

Q. 20. Have you abandoned the use, and if so, for how long, of this two internal wired tire of the Grant patent?

A. We have, and about three years.

Q. 21. For what reason?

780 A. For no other reason than that the customers demanded side wires.

Q. 22. Were these side wire tires stretched on the outside and each side of the tire to hold it in the channel by the same machine as the Grant tire?

A. No, sir.

Q. 23. How tight are these side wires put on the tires to hold them in the channel?

A. About the same tightness as the inside wire.

Q. 24. About the only difference between the Grant tire of the patent and the side wire tires is that the two wires are put on the outside of the tire and below the

edge of the rim to hold the tire in place, instead of being 781
run through the tire; is that it?

A. Well, I don't know the difference in the patent. The only difference is that one goes on the outside and the other goes on the inside. I don't know any difference of the patent.

Q. 25. In these two outside wire tires did you ever see these outside wires rise or fall or move up and down in any way, when the wheel was subjected to severe side strains or the tires given lateral movement in travel?

A. No, sir.

Q. 26. In the internal two-wire tires like the Grant patent when you personally set those tires in place and 782
brazed the wires, did you stretch equally both wires by the machine as to tension?

A. Yes, sir.

Cross-Examination by Mr. Stapleton.

X-Q. 27. I understand you to say that you abandoned the use of the Grant tire about three years ago; is that correct?

A. Yes, sir.

X-Q. 28. So that you only used the Grant tire about one year? 783

A. We put them on since 1894, that is what I meant.

X-Q. 29. Where did you put them on?

A. At our place of business in Brooklyn.

X-Q. 30. So that you were actually putting them on for about ten years?

A. Yes, sir.

X-Q. 31. About how many did you put on during that ten years of the Grant tire?

A. We averaged a hundred set a year.

X-Q. 32. Of the thousand sets that you applied during the ten years, about what proportion did you buy

784 of or apply that were furnished by the complainant in this action, or its predecessor, the Rubber Tire Wheel Company?

A. I should judge about 600 sets.

X-Q. 33. Then you bought and applied about 400 sets from parties other than the complainant and its predecessor?

A. Yes, sir.

X-Q. 34. And you think you commenced to apply this type of tire in 1894, do you?

A. Yes, somewhere about that time.

X-Q. 35. Have you always applied them in the same
785 way and with the same machinery?

A. No, sir, we have used two other kinds of machines besides the one we now have.

X-Q. 36. Did you ever apply any by first forming the tire into a hoop and then stretching it on over the flanges after the ends of the wires had been united?

A. No, sir.

X-Q. 37. Don't you know that prior to the year 1899 that no rubber tires of this type were applied in this country, or any other, by drawing them up in the channel, and that all of this kind of tires prior to the year 1899
786 were first formed into a hoop with the ends of the wires united and then thrown over the flanges?

A. No, sir; but prior to that we had tires put on in Boston by the Boston Rubber Company, and they were cemented on, and those were the first tires we put on.

X-Q. 38. Prior to when?

A. 1899.

X-Q. 39. And when did you abandon the cemented on tires?

A. About three years later.

X-Q. 40. What are these tires called that you have been applying for the last three years?

A. McMahon's, Goodrich, Firestone and Diamond. 787

X-Q. 41. Are they all commonly known as the Firestone tire?

A. They are commonly known as the Firestone patent, except the McMahon tire.

X-Q. 42. And as you understand it, were all made under the Firestone patent, except the McMahon tire, were they?

A. Yes, sir.

X-Q. 43. Those tires in addition to having the longitudinal wires on the outside of the rubber, have a great number of cross wires running through the base of the tire, just beneath the side wires, do they not? 788

A. Yes, sir, except the McMahon tire, which has no cross wires.

X-Q. 44. And in tires of the Firestone type the longitudinal retaining wire rests upon the ends of these cross wires, does it not?

A. Yes, sir.

X-Q. 45. Are you using the McMahon tires now?

A. No, sir.

X-Q. 46. When did you abandon the use of the McMahon tires?

A. About two years ago. 789

X-Q. 47. Because they were unsatisfactory?

A. Yes, sir.

X-Q. 48. Did you abandon the use of the cemented on tires because they were unsatisfactory?

A. Yes, sir.

X-Q. 49. Are you pretty well informed, Mr. Duhamel, as to the litigation that has arisen over the Grant patent?

A. No, sir.

X-Q. 50. Is it your understanding that these Firestone tires which you are now using, and have been using

790 for the past three years, have been made either by the Firestone Tire & Rubber Company or by its licensees, the Goodrich and Diamond companies?

A. Yes, sir.

X-Q. 51. Did you know that the Firestone Tire & Rubber Company owned the patent for this side-wire tire, sometimes called the Firestone tire and sometimes the cross-wire tire?

A. Yes, sir.

X-Q. 52. Did you not know that this same Firestone Tire & Rubber Company that owns the patent for this cross-wire tire also manufactured the Grant type of tire?

791 A. I do not.

X-Q. 53. Do you not know that the complainants in this action brought suit against the Firestone Tire & Rubber Company for infringing the patent in suit, by making tires of the Grant type, and that they were successful, and that the Firestone Company has been adjudged an infringer of the Grant patent, both in the Circuit Court and Circuit Court of Appeals in the court in New York City?

A. No, sir.

X-Q. 54. How long since you have purchased any

792 of the Grant type of tires from the complainants, or any of their branches?

A. About three months ago.

X-Q. 55. Was that the Grant type of tire that you purchased three months ago of the Consolidated Rubber Company?

A. Yes, sir.

X-Q. 56. So that you still continue to use the Grant type of tire as well as the cross-wire tire; is that correct?

A. Whenever our customers demand it we use internal-wire tire.

X-Q. 57. Then there is some demand from your customers for the internal-wire tire? 793

A. Yes, sir, only in the small sizes.

X-Q. 58. What do you mean by the small sizes?

A. From 7/8 of an inch up to an inch and a quarter.

X-Q. 59. Have you any preference for the different types of rubber tires?

A. Yes, sir.

X-Q. 60. Which do you prefer?

A. Either the Goodrich or the Consolidated.

X-Q. 61. In referring to the Goodrich in your last answer, did you mean the Goodrich internal two-wire tire?

A. Yes, sir. 794

X-Q. 62. Which is the same as the Consolidated or the Grant type, is it not?

A. Yes, sir.

X-Q. 63. Now, Mr. Duhamel, I assume that you are at the head of your carriage business?

A. No, sir, not quite the head, for father, he is still head of the business.

X-Q. 64. Well, do you actually apply the tires yourself, or is that left to your workmen?

A. All tires have been put on by myself and a helper.

X-Q. 65. I don't suppose, Mr. Duhamel, that you claim here that you can actually detect when a tire is in actual use, that is, revolving with the wheel, just what occurs within that rubber tire, can you? 795

A. Not exactly.

X-Q. 66. It would be absolutely impossible, would it not, for you or anyone else, when a vehicle is being driven in use, to actually tell whether or not when the tire became subject to wrenches or twists or side thrusts, it in any way changed its position?

A. Yes, sir.

796 X-Q. 67. And is that because it is entirely concealed from view?

A. No, sir.

X-Q. 68. Is it not entirely concealed from view; I refer to the Grant type of tire?

A. Not always.

X-Q. 69. When tires of the Grant type are properly applied are not the retaining wires entirely concealed from view?

A. Yes, sir.

X-Q. 70. Being thus concealed from view, then it would be utterly impossible, would it not, to actually tell
797 just what occurred to the retaining wire, especially when they are revolving in actual use?

A. Yes, sir.

X-Q. 71. I suppose you have never made any critical or particular examination when these Grant types of tire were actually revolving upon wheels in use with a view of ascertaining just what happened to them, have you?

A. Yes, sir.

X-Q. 72. Please explain what examinations you have made.

A. Ofttimes we have had tires that have been caught
798 in frogs, where the channels have been broken and the rubber tire buckle.

X-Q. 73. Explain briefly what you mean by buckling.

A. When tires are caught in frogs, or in other words, switches, the channels are always broken, and the rubber becomes twisted and the wires show through; that is the only way I can explain it.

X-Q. 74. Do they show through from the bottom or the sides?

A. Sometimes from the sides, and sometimes from the bottom.

X-Q. 75. In other words, the strain on the rubber is 799
sufficient to tear it; is that correct?

A. Yes, sir.

X-Q. 76. And is this strain sometimes sufficient to break the wire, as well?

A. Yes, sir, we have seen cases that way.

X-Q. 77. Suppose, Mr. Duhamel, that the rubber did not tear and the wire did not break when it was caught in the switches you mentioned, and was still subject to a most severe strain, what would happen to the interior part of the tire?

A. Nothing that I know of.

X-Q. 78. You appreciate, do you not, that in tires of 800
the Grant type, when properly applied, that these two retaining wires form a complete hoop within the rubber entirely encircling the wheel; that is true, isn't it?

A. Yes, sir.

X-Q. 79. And that there lies beneath the under side of the retaining wires at all points a mass of rubber?

A. Yes, sir.

X-Q. 80. Do you understand whether or not rubber such as is used in the Grant type of tires, is compressible or non-compressible?

A. It is compressible.

801

X-Q. 81. You think that if you subject a piece of rubber tire to a heavy weight that it will squeeze into itself, so to speak, do you, after the manner, say, of a cork?

A. Yes, sir.

X-Q. 82. And what is your judgment as to the rubber which lies beneath the retaining wires and between the under side of the retaining wires and the steel channel when upon the wheel and properly applied, is that rubber harder or more dense than the other rubber surrounding the wires?

A. I think so.

802 X-Q. 83. About how much harder or more dense do you think it is than the surrounding rubber?

A. I don't know how I can describe that; for in putting on a tire we have to allow the tire about an inch to every foot longer than the circumference of the wheel, and naturally the base of the tire will compress more than the outside, which would make it about twice as hard.

X-Q. 84. Well, being in your judgment about twice as hard, would it still be soft enough to yield if considerable pressure were applied?

A. No, sir, I don't think it would yield.

803 X-Q. 85. You think that the underlying rubber which I have been describing would be perfectly rigid, like a piece of iron, do you?

A. Yes, sir.

X-Q. 86. And that it would be just as unyielding as though it were a piece of iron which lay beneath the retaining wires?

A. Yes, sir, barring accidents.

X-Q. 87. Have you ever made any experiments with a view of determining whether the theory which you have enunciated is correct or not?

804 A. Yes, sir.

X-Q. 88. Please describe those experiments?

A. In trying to pry off tires after they have been properly applied.

X-Q. 89. Well, what happens then?

A. We cannot possibly move the base of the rubber at all.

X-Q. 90. You still have not described your experiments, if any; please do so?

A. We have tried by placing screw drivers and coal chisels under the base of the tire and tried to force off the bottom of the tire to raise same above the channel;

and we have found the base of the tire almost as hard as iron, and it would not yield. That's the best I can describe it. 805

X-Q. 91. And you didn't succeed in prying them off over the flanges, is that correct?

A. No, sir, we have not succeeded.

X-Q. 92. Did you ever partially succeed?

A. No, sir.

X-Q. 93. Never got any implement down in under the rubber, did you?

A. No, sir, not when they were properly applied.

X-Q. 94. How many times have you tried those experiments? 806

A. At least thirty or forty times in our experience of putting on tires.

X-Q. 95. Then, I judge you didn't become satisfied with your first efforts, otherwise you would not have tried it thirty or forty times; is that correct?

A. Yes, sir.

X-Q. 96. What do you mean by yes, sir, that you were satisfied from your first experiments that you couldn't succeed?

A. I mean, as we went along putting on rubber tires the only way that we could find out if the tires were tight enough we kept on trying this test to see that we had all our tires put on the same way. 807

X-Q. 97. What tests do you refer to?

A. The tests I spoke of applying the screw driver and cold chisel.

X-Q. 98. That test was in endeavoring to get a cold chisel or screw driver beneath the base of the tire, is that what you mean?

A. Yes, sir, and see if the tires were properly applied.

X-Q. 99. And do you still use that test?

A. No, sir.

808 X-Q. 100. Well, how was it a test if you couldn't get your cold chisel or screw driver beneath the base of the rubber?

A. There were times that we could, and when we found out that we could, we took the tires off the wheels and reapplied them again.

X-Q. 101. You mean to say, Mr. Duhamel, do you, that if the tire is properly applied, that it is impossible to insert an instrument like a screw driver blade between the side of the rubber and the steel flange and thus work it under the rubber to such an extent that you can see or feel the rubber move or raise?

809 A. Yes, sir.

X-Q. 102. Then it would surprise you to know that there has never been a tire applied of the Grant type so tightly and could not be applied so tightly with two wires but what you can with your naked hands insert the blade of a screw driver between the sides of the tire and the steel flange, and thus get it beneath the rubber and the wire?

A. It would.

X-Q. 103. Don't you know that that is done every day by the numberless people that are applying tires of

810 this type throughout the country?

A. No, sir, I do not.

OMAIRE J. DUHAMEL.

Defendant's counsel here gives notice that this deposition closes the taking of testimony under the notice given at New York, and defendant's counsel now formally gives complainant's counsel notice that upon January 2d, 1908, at Room 1228 Monadnock Building, in the City of Chicago, County of Cook, and State of Illinois, at 10 o'clock in the forenoon of that day, before Frederick C. Goodwin, a notary public, in and for said city, county and state, or some other officer duly authorized to administer an

oath at the place of taking such testimony under the federal statute, he shall proceed to take testimony in behalf of the defendant, at such time and place, the witnesses to be examined being Louis T. Mann, Samuel N. Pond and others, and the testimony will proceed from day to day until completed; and defendant's counsel asks complainant's counsel if he desires any further or formal notice of the taking of the testimony as above given. 811

Complainant's counsel states that the notice upon the record is sufficient.

UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK. 812

Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, *Complainants,*

vs.

The Diamond Rubber Company of New York, *Defendant.*

At the City of Chicago, County of Cook and State of Illinois, at Room 1228, Monadnock Building in said city, on the 2nd day of January, 1908, at 11 o'clock in the forenoon, before me Frederick C. Goodwin, a notary public in and for said city, county and state, personally appeared Mr. Border Bowman on behalf of complainant, and Mr. C. K. Offield on behalf of defendant, and thereupon the following proceedings were had, pursuant to due notice given. 813

Defendant calls as witness in defendant's behalf LOUIS KUEHNE, who being first duly sworn testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

814 A. Louis Kuehne; age 42; 4332 Langley Ave.; carriage builder.

Complainant's counsel requests that the witnesses be separated, there being some five witnesses present in the room, who were all sworn at the same time.

Defendant's counsel declines to join in this request or consent to it, for the reason that this is a civil case, the witnesses being of high character and repute and that there is no suggestion of conspiracy or unfairness as to the testimony of these witnesses and that it is an open reflection upon the
815 character of the witnesses to make such a request and an endorsement of such a request, to join in or assent to it.

Complainant's counsel states that as Mr. Offield failed to introduce him to the witnesses or even state who the gentlemen were it is impossible for him to know, but as the questions of fact are in dispute in this case, and also questions of opinion seem to be conflicting among defendant's witnesses themselves, complainant's counsel insists upon the propriety of his request and notes an objection to de-
816 fendant's refusal to comply with it.

Q. 2. How long have you been engaged in the building of carriages continuously in Chicago?

A. I have been in business in Chicago for nineteen years.

Q. 3. How much of that time for yourself?

A. Ten years without a partner—10 years by myself.

Q. 4. How extensively during the last nineteen years and actively have you been engaged in this business; say in comparison with your competitors in the same line?

A. I have employed on an average of fifteen to twenty men continuously. 817

Q. 5. I now show you the tire illustrated, or the illustrations of the tire of the Grant patent as shown in the patent in suit, and ask you if you are familiar with that tire as shown and described in this patent and for how long a time?

A. I am familiar with the tire ever since its introduction about 1904 or '05. I mean 1894 or '95.

Q. 6. From whom did you first get those tires?

A. From the Rubber Tire Wheel Company, Chicago.

Q. 7. Did you buy this Grant tire then, outright? 818

A. I did.

Q. 8. Who put the tire on the wheel.

A. The Rubber Tire Wheel Co.

Q. 9. Did you mean that you sent your wheels that you wanted tired down to the Rubber Tire Wheel Co., and had them put on there in the first place?

A. Yes.

Q. 10. Do you know how the Rubber Tire Wheel Co., the complainant, put those tires on your wheels in 1894 or '95, did you see them put them on?

A. I did not see them put on.

Q. 11. Do you know whether the manner they put 819 them on at that time was secret or was it open to everybody?

A. They kept everybody out of the rubber room. I wanted to see them applied and was not permitted to see it.

Q. 12. When did you first begin to put on the solid rubber tires of this patent on wheels yourself?

A. About '96 or '97. I think about '98 it was.

Q. 13. How did those tires that were put on for you by the complainant, the Rubber Tire Wheel Co., of Chicago, before you began to put them on yourself, in the

820 year 1898, how did those tires wear as to condition and use. I mean how were those tires ruined or destroyed as tires?

Counsel for Complainant: Objected to asking for secondary evidence.

A. The tires usually after they had been in use for some time cut out on the side, and sometimes at the bottom.

Q. 14. What cut the tires out on the sides and bottom if you know before they were destroyed by use?

A. The tires were cut out usually by the rust that gathered in the channels at the sides between the rubber
821 and the channel. The pressure of the rubber against the side of the channel caused the friction and the friction was what wore the rubber.

Q. 15. The friction between what?

A. The friction between the rubber and the channel. That is what wore it, unless you would say the rust in the channel was what wore out the rubber, the rust being closer to the rubber.

Q. 16. How did the tire cut through as to the retaining wire?

By consent, objection made to Q. 13 to apply
822 once for all.

A. Why, the rubber would open up from the side up to the retaining wires, and sometimes would cut through the retaining wire.

Q. 17. Prior to the time that you began to putting on the solid rubber tires yourself at the time of the patent, in the year 1898, did you ever know of an instance where those solid rubber tires had worn out or worn down to the channel without being destroyed by cutting through at the sides or bottom?

A. I couldn't say that positively whether I did or not.

Q. 18. But the instances were few, if any?

Objected to as leading. 823

A. Few if any.

Q. 18*a*. About the year 1898, when you began putting on these solid rubber tires yourself at the factory on your wheel, how did you put those tires on the wheels or get them on?

A. We scarfed and brazed the wires. Why, we would cut the rubber the required length and insert the wires into the rubber, then put one end of the wires into the machine, clamping them firmly, then file the scarf on the wires, then the other end of the wire and rubber was fastened to the opposite end on a shaft in the machine. 824
The wires were then drawn up tight, leaving exposed about five inches of the wire between two sets of jaws. The wire was then filed off at the proper place to fit the scarf previously filed on. A piece of asbestos was laid under and back of the wires and the wires were then brazed with a gasoline torch; when the wires were cooled or cold the wheel was moved from the machine, then the rubber was drawn together at the joint.

Q. 19. How tight could you strain these wires by the machine? What power could you apply in tightening and locking the tire in the channel by tension put upon the wire? 825

A. We would draw the wires as tight as we could get them; would sometimes break the wire by pulling too hard.

Q. 20. Did the machine draw both wires with equal tension?

A. It did.

Q. 21. What kind of wheels or vehicles for the last twelve years have you been putting on these tires?

A. All kinds of light and heavy buggy and carriage wheels; also put some on automobiles.

Q. 22. Without being entirely exact, give your

826 best estimate as to about how many, each year, of these kind of tires you put on or took off of vehicle wheels?

A. Oh, I dare say, a thousand each year.

Q. 23. Have you ever noticed in the wheels upon which you have taken off these solid rubber tires that have been clamped in position by the two wires as you have described,—have you ever noticed whether these tires or the bottoms of them have become fastened to or rusted onto the channel or rim of the tire?

A. I have seen many of them.

Q. 24. How much force would you have to use to strip or tear the base of the tire from the channel that
827 had become thus fastened by rust?

A. Giving it a good pull with the hand it would come off.

Q. 25. It has been stated that this Grant tire, after it has been wired on to the full tension or strength of the two retaining wires in the manner you have described, that such tires in actual use and travel and when subjected to hard usage by lateral blows or thrusts received in travel, such as getting out of ruts and car tracks, that the wires holding the tires in place will rise and fall or lift and re-seat themselves at the point of
828 strain in the revolution of the wheel, and permit the tire itself to thus, by movement of the wires, adjust and rise and re-seat itself in the travel of the wheel and in the carrying of the load. Now will you state what is the fact as to knowledge, during the ten years use of these tires, as to any tipping capacity of the tire itself by reason of the wires rising and falling at the point where the strain comes upon these tires in travel?

Counsel for Complainant: Question objected to as an inaccurate summary, and as an effort to lead the witness.

A. It is my opinion that if the tire is applied properly

and the wires have the proper tension there is no chance for the rubber to rise from the channel, the strain would be all above the wires,—or rather the give to the rubber would be all above the wires. 829

Q. 26. Then as I understand you, after these two retaining wires of the Grant tire have been drawn to their fullest tension capacity without breaking, you cannot as a matter of fact, by any strain of travel put on the wheel, lift these wires from their seat without breaking them, and whatever movement there is as to the tire construction must be by resiliency and elasticity of the rubber.

Complainant's Counsel: Objected to as an effort to lead the witness and as not stating in full what the witness gave as a previous answer. 830

A. I think I answered that question, practically, by my previous answer. That is my opinion in the matter.

Q. 27. These solid Grant tires that you have put on yourself, since the year 1898, how have they been worn out or destroyed in actual use? What was their condition, if for any reason they had to be replaced?

A. In most cases the rubber was worn down to some extent, but in nearly every case they were cut through on the sides. That was the cause of our replacing them, because they were worn out and cut through on the sides. 831

Q. 28. How many makes of tires, besides the tire of complainant, the Rubber Tire Wheel Company, are you familiar with?

A. About ten or twelve makes.

Q. 29. Do you notice any difference as to the wear of the tires upon the different wheels? I mean the same vehicle?

A. The tires on the front wheel usually wear out sooner than the rear.

Q. 30. Have you noticed any difference as to the im-

832 provement in the quality or character of the rubber used in these tired wheels since 1894 or 1895?

Question objected as calling for an opinion on a matter as to which the witness has not qualified.

A. I don't think the rubber as manufactured at the present time is equal to what it was eight or nine years ago, as to wearing qualities.

Q. 31. Does this apply to all manufacturers or to some of them?

A. I think I can qualify this last statement by saying there is not any tire made at the present time that will wear as long as they did eight or nine years ago.

838 Q. 32. During the last ten years, how actively have you been personally engaged either in taking off or putting on these solid rubber tires?

A. I have put on a good many myself and taken off a good many.

Q. 33. Have you during that time, as the owner of the business and being responsible for it, directed the manner of putting on these tires and practically looked after both putting them on and taking them off?

A. I have given the matter of applying the rubber tires my personal attention ever since we have applied

834 tires.

Q. 34. Where did you get the channel or rims which you put on the wheels and on which you fastened the tires?

A. We can now buy them in the open market. Years ago they were only sold by rubber manufacturers.

Q. 35. Do you know who now makes these rims?

A. I don't know who makes them, only in a general way.

Cross-Examination by Mr. Bowman. 835

X-Q. 36. Did you have experience with rubber tires prior to the introduction of the Rubber Tire Wheel Company's rubber tire, which you state was in 1894 or '95?

A. I knew of rubber tires of an English make being in use.

X-Q. 37. Was that a tire known as the "English or clincher tire," and handled by Kimball and some large concerns in Chicago?

A. That is the one I referred to.

X-Q. 38. When was that?

A. About '91 or '92. 836

X-Q. 39. When did the tire cease to be handled in Chicago before or after the Rubber Tire Wheel Company started?

A. I can't say as to that. I don't think there was any more of those tires used after the Rubber Tire Wheel Company's product was put on the market.

X-Q. 40. Referring to your answer 23, you say: "the strain would be all above the wires—or rather the give to the rubber would be all above the wires." Will you please explain a little more fully what you mean?

A. I mean that if the wires were drawn up as tight 837
as they should be it will hold the base of the rubber firmly to the channel. When there is a strain on the rubber, I don't think it would move the base of the tire.

X-Q. 41. Then do I understand that you do not think the wires or either of them, which are in the base of the tire, would possibly move upwardly or away from the base by any possibility without breaking them, or something of that kind?

A. I don't think it would.

X-Q. 42. I now hand you what purports to be a drawing of a rubber tire having a wire therein, and call

838 your attention to the position of the wire marked d^1, in which seems to show the wire raised on the bottom of the channel, and ask you if, according to your opinion, as to the operation of the rubber tire in use, whether that is a correct representation?

A. I don't think it is possible for a tire to be in that position if the wires are as taut as they should be (Witness refers to Defendant's Exhibit, Pond's Drawing No. 1).

X-Q. 43. I call your attention to the drawing because defendant's expert introduced this drawing as explaining a theory of his that under excessive strain one
839 of the wires might be bent out of normal position without any movement of the rubber occurring. But, as I understand you, you are not willing to accept that condition to be possible, if the wires are drawn as tight as possible?

A. That is my opinion.

LOUIS F. KUEHNE.

Recess until 2:15 P. M.

Thereupon defendant calls as a witness, in defendant's behalf, CHARLES F. HUDSON, who being duly
840 sworn testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation?

A. Charles F. Hudson; age, 52; occupation, salesman; residence, 4459 Prairie avenue.

Q. 2. Are you familiar with the solid rubber tires and their application that forms the subject matter of this suit and is shown in the Grant patent in suit in the drawings of the patent now exhibited to you?

A. I am familiar with the sale of this tire and other tires but not entirely as to the application.

Q. 3. How long have you been familiar with the sale 841
of these tires like the Grant tire in suit, and in connection with what manufacture or dealers of such tires have you been salesman?

A. Since 1896 with the Peoria Rubber Company, of Peoria, Illinois, and the International Tire Company as Manager of Sales, New York City.

Q. 4. Over what period of time did this experience extend as salesman of such tires, continuously?

A. About seven years.

Q. 5. What knowledge did you have during that time of the personal application of these tires to wheel vehicles and the action of these tires in use upon such 842
vehicles?

A. My first experience with the solid tire was with the International Vehicle Tire & Rubber Co., of New York City, with a solid tire that fastened through the felloe. We made an application of this tire for about two years and discontinued it then on account of the fastening not being successful. We changed from this tire to the two wire internal fastenings.

Q. 6. Well have you any personal knowledge as to the application of these two internal wire tires?

A. Only as I seen them applied in the shop. 843

Q. 7. To what extent have you seen them applied in the shop?

A. To the extent of four years experience after we discontinued the fastening through the felloe.

Q. 8. How many of these two internal wire or Grant tires like the patent in suit have you ever seen applied to different kind of vehicles?

A. I should say thousands of them.

Q. 9. When these Grant tires were destroyed in use upon wheels before being worn out, in what manner were they destroyed?

844 A. Mostly by the cutting out of the rubber.

Q. 10. At what points of the tire?

A. Along the side.

Q. 11. Have you ever seen or known of these solid rubber tires remaining in the channel without the rubber being cut out until the tire is worn practically down to the rim?

Objected to as immaterial, and as calling for secondary evidence, and by consent this objection is to stand as to all subsequent questions and answers on the same subject.

A. No I never have.

845 Q. 12. Whom do you come in contact with as salesman in your sale of the solid two wire tires like the patent in suit? Who do you sell these tires to?

A. To carriage manufacturers and rubber companies applying tires.

Q. 13. In this connection have you come in contact with and sold these tires to practically all of the leading carriage builders in Chicago and vicinity?

A. My territory might be the United States I have covered it all.

Q. 14. Have you ever at any part of the United
846 States or from any carriage builder or repairer heard it claimed that this solid rubber tire when wired and locked in position by the two retaining wires in the channel has any capacity for tipping or the wires could move up and down in any way under the severe strain of the wheels in travel, such as the wrenching motion of the wheels in the car tracks of the cities or in the ruts in the country roads in turning out?

Objected to as absolutely immaterial, as to whether this witness heard of any such explanations, it being proved by defendant's witnesses that the two wire internal tire was the successful tire,

there would be no reason for the salesman under- 847
taking to explain why this was so.

A. There have been differences of opinion in this direction, but my increased sales came from the fact that an internal fastening of two wires with the tires properly applied was much better than that of tires applied by tape or improperly applied.

Q. 16. I evidently did not make myself clear in the question. Have you ever known or heard it claimed that this solid rubber tire, when clamped in position in the rim by the two retaining wires drawn to their utmost capacity without breaking—have you ever known or heard that such tire or the wires of such tire could rise 848
and fall in the channel when subjected to most severe usage of such a tired vehicle in travel?

Objections repeated and further objected to as being leading and counsel calls the court's attention to the clever use of the word "clamped."

A. I never have heard and I don't believe they can, when properly applied.

Q. 17. Could you state even approximately how many of such tires of the style of the Grant tire in suit that you have personally sold in the United States during the last ten years? 849

A. A hundred thousand such.

Cross-Examination by Mr. Bowman.

X-Q. 18. Mr. Hudson who asked you to come here to testify?

A. The Diamond Rubber Company.

X-Q. 19. Do you mean the Chicago Branch?

A. Yes, sir.

X-Q. 20. Does the Diamond Company maintain a factory at Akron, Ohio, do you know?

A. At the last reports I believe they are still there.

850 X-Q. 21. Well I meant to bring out simply whether it is the Diamond Company that manufactures rubber, which you have referred to as the Diamond Rubber Company?

A. Yes, sir.

X-Q. 22. Was it by a letter from the Company itself or from their representative in Chicago that you were asked to attend here?

A. It was through their representative here in Chicago.

X-Q. 23. Were you informed that they had been sued for an infringement of the Grant patent?

851 A. I was.

X-Q. 24. You were present this morning during the session here were you not?

A. Yes, sir.

X-Q. 25. During what period did you handle the Peoria tires?

A. Just through '96 and part of '97.

X-Q. 26. Do you know whether that tire was originally manufactured at Indianapolis?

A. It was manufactured originally at Akron.

X-Q. 27. And was the factory then moved to Peoria?

852 A. To the best of my knowledge it was.

X-Q. 28. It was a clincher form of tire was it not?

A. The Peoria Tire was a clincher tire.

X-Q. 29. There was testimony in the Kokomo case about this tire and the following statements were made by a witness by the name of Jacobs: "What was your experience with the Peoria clincher tire? A. It gave very poor satisfaction. Q. What was the trouble with it? A. The rubber split where the tire clinched it and rolled off." Does this conform with your recollection as to your experience with Peoria clincher tire?

A. It certainly does.

X-Q. 30. Did you cease to handle it by reason of 853
those objections?

A. No sir.

X-Q. 31. I understood you to state off the record, when I read from that testimony, the fact that it did not give satisfaction, that that was the reason that you quit it. If I am wrong in this please explain why you did quit it, or why it quit you?

A. Well I did not have reference to a Peoria tire. I had reference to the International tire and quit the Peoria tire because I secured a better position with the International people.

X-Q. 32. How did you know that there were objec- 854
tions to the Peoria tire such as those I mentioned in a previous question, as explained by a witness in the Kokomo case, viz: that the tire would roll off?

A. By personal experience at the factory where the tire was manufactured.

X-Q. 33. Did you acquire that experience in the year 1896?

A. 1896 and '97.

X-Q. 34. Well was it really at the factory or from customers who tried the tire that you found out as to the objection?

855

A. It was from the customers that I was at the factory and gained my knowledge there.

X-Q. 35. Were you in active competition at that time with the Rubber Tire Wheel Company's tire?

A. I was in a way, but not to any extent, because we had quit manufacturing the tire on account of poor service.

X-Q. 36. Well I am still at a loss to understand the facts—as to whether you quit this tire before you quit manufacturing it and went with the International Company, or whether the Peoria Company quit manufactur-

856 ing at the same time you went with the International, or just what the facts are. Will you please explain?

A. They were still manufacturing this tire in a small way at the time that I quit the Peoria Company, but the sale on the same was very limited.

X-Q. 37. Do you remember how soon after you quit that the company quit altogether?

A. I do not.

X-Q. 38. But it wasn't long, was it?

A. Not very long.

X-Q. 39. Now you have referred to the International Tire Company. Do you remember that that was the
857 successor to the New England Rubber Tire Company?

A. Yes, sir.

X-Q. 40. It was a Boston Company originally, was it not?

A. Boston or Chelsea, somewhere down there.

X-Q. 41. They originally—that is the New England Company—tried fastening the rubber in the channel by running the single retaining band down through the felloe, and then when the International Company took hold of that band tire they changed the construction did they not?

858 A. In about one year's time.

X-Q. 42. The International Company then used a lock nut device or attempted to improve the connections between the felloe and the band, still retaining a rigid connection between the band and the felloe, did they not?

A. They did.

X-Q. 43. You spoke of this International fastening not being successful. Do you remember what the chief objections were?

A. They could not apply the rubber tight enough with a band and the fastening was entirely unsatisfactory

X-Q. 44. Well do you remember whether the fastening would break? 859

A. In some cases yes. Most cases yes.

X-Q. 45. At what point would it break, usually?

A. The band would break within a half a foot of the fastening.

X-Q. 46. Were you familiar enough with the construction that they used prior to the use of this lock nut construction, to say what the objections were with the prior device?

A. I am not familiar enough with it.

X-Q. 47. Well you certainly would not say that the tires could not be put on tight enough with a heavy tape 860
or band and running the ends of the band through the felloe and fastening the ends of the band to the felloe, would you?

A. I do say so, yes.

X-Q. 48. By that I understand then that you think that the bands could not be drawn tight enough?

A. Not with the applying machine that they had at that time.

X-Q. 49. Were you accustomed to use that applying machine yourself?

A. I was not. 861

X-Q. 50. Please state whether you think, as a matter of tightness that band would be tighter or looser than the two wire tire when the wires were fastened together and the rubber jumped on the wheel as was the early method?

A. The two wired application was the tightest and if the application was perfect the tire could not jump, according to my belief.

X-Q. 51. Well you plainly misunderstood my question, and possibly you are not aware that during the early history of the Rubber Tire Wheel Company's tire they

862 jumped the rubber tires on the wheel. Do you know that to be the fact?

A. I have heard of this tire, but never have seen it.

X-Q. 52. Well it was the same tire in every respect, but instead of the rubber being placed in the rim of the wheel and the ends of the wire then fastened, the ends of the wires were fastened before the rubber was placed in the rim so that it formed an endless tube and this tube was then jumped on the rim. Now I ask you whether those wires would in your judgment be tighter than the band of the New England or International, fastened as tight as could be done with their appliances?

863 A. I have not studied this question and I am not competent to answer.

X-Q. 53. Did you ever handle Morgan & Wright's band tire?

A. I never did.

X-Q. 54. How long have you known of them?

A. Ever since I have been in the business.

X-Q. 55. How long since they took up with the two wired tire?

A. That I couldn't answer. They used both the wire and the tape.

864 X-Q. 56. Do you understand that Morgan & Wright are still selling and advocating the use of the band tire, —by that I mean the tire they sold at one time having a flat tape or band passing through the rubber with the ends of the tape or band fastened together?

A. I understand that they are now advocating the two wire tires.

X-Q. 57. Do you think they had any trouble with getting a band tight enough?

A. Well with the amount of trouble they had among the manufacturers there must have been something wrong,—I don't know what it was.

X-Q. 58. I am quite willing to concede that they have had enough trouble with their tire, but as you had expressed the opinion as to the proper tightness of the fastening devices, I wanted you to state whether you seriously thought that there was a failure of their being able to draw that band tight enough? 865

A. Wherever the application was properly made of the Morgan & Wright tire the tire was put into a channel so that it could not ride or move. I believe their tire was a success.

X-Q. 59. Well I am not asking you as to what you believe as to the tire being a success, but I am trying to ascertain whether you think it was impossible for them to have gotten that tire in tight enough—somewhat as you said the International Company's trouble was because they could not get it tight enough? 866

A. Morgan & Wright could get a tire in tight enough.

CHAS. F. HUDSON.

Thereupon defendant called as a witness, in defendant's behalf, FRED C. KOENIG, who being first duly sworn testifies as follows in answer to interrogatories propounded by Mr. Offield: 867

Q. 1. Please state your name, age, residence and occupation?

A. Fred C. Koenig; 33; 425 Wabash; Chicago; occupation, salesman and practical tire man.

Q. 2. Salesman for who and for what?

A. Chicago Rubber Tire Company.

Q. 3. Are you familiar with the solid two wire shown and illustrated in the Grant patent in suit now before you?

A. Yes, sir.

868 Q. 4. How long have you been familiar with that tire?

A. About two and a half years.

Q. 5. What experience have you had with this Grant tire in the last two and one half years, I mean personal and practical experience as to the putting on and locking the tire in place on the wheel rim and the wear and tear of the rim in use when so fastened?

A. Why I did nothing but applying tires for two years.

Q. 6. How did you apply those tires,—I mean what means did you use in putting the tire on the rim and
869 fastening them in final position for use?

A. Why the Nelson & LeMoon Table Machine.

Q. 7. Well just describe what you did to place and fasten these tires upon the rim by this machine?

A. After getting the rubber the proper length, inserting the wires, clamped one end of the wires in one pair of jaws. After skiving the ends we put the other end of the wires through another pair of jaws and fastened in a dog which is at the end of a long worm by means of which we pull them up as tight as we can get them without breaking. After cutting the ends the proper
870 length we skived the ends of the wire. We braze them with a gasoline blow torch.

Q. 8. During the last two years and a half how many of these tires, approximately, have you put on and taken off of different kinds of wheels?

A. As high as thirty a day.

Q. 9. What kinds of vehicles principally.

A. Light and heavy buggy, carriage, and motor truck tires.

Q. 10. In what manner have these tires, if at all, been destroyed or rendered useless as a tire upon vehicles

without being worn out on their surface or tread portion of the tire? 871

A. Well there are different manners of wearing them out. Some from poor workmanship, or mixing rather of the compound; some of them being cut out at the side by the wire; some of them the compound not being properly cured, thereby cutting out on the side, by overlapping the channel.

Q. 11. How about cutting out on the bottom of the tire by the wire?

A. Some of them will cut out at the bottom. But that is caused by not being properly applied.

Q. 12. What proportion of these tires that you have put on and taken off as you have described, were worn out by the rubber being worn down to the channel and the tire base still in position without cutting out the bottom of the tire? 872

A. Very few if any.

Q. 13. Among these hundreds and thousands of tires that you have put in position by using this machine which you have described and which you have taken off from wheels to be replaced, as to any one of these tires, have you ever known or heard of an instance where the two wires of the tires or either of them permitted the tire to tip up or the wires themselves tipped up to adjust themselves or meet the side thrust or strains that were put upon the tire in actual use in service, even of the severe style? 873

Objected to as leading.

A. Never, only in case of broken wires.

Q. 14. From your knowledge of the locking position of these tires and the channel rims of the wheels by the straining of both wires to their utmost capacity of tensile strength in so doing, is it possible by any kind of strain that you can put upon the rubber tire itself to lift or

874 un-seat these wires from their position or cause them to rise and fall?

A. No sir. It is not possible for them to rise from their position after they have once been properly applied.

Q. 15. In taking off or replacing these old tires have you ever noticed the fact of the tires being stuck or cemented to the rims by rusting and being kept in one position?

A. Yes sir.

Q. 16. About how much strength would you have to use in tearing these rusted two wire tires loose from the bottom or bed of the channel?

875 A. Sometimes it would take a good jerk with the hands.

Cross-Examination by Mr. Bowman.

X-Q. 17. What rubber tires does the Chicago Rubber Tire Company handle?

A. All makes.

X-Q. 18. For instance?

A. Diamond; Consolidated; B. F. Goodrich Company; Republic Tire & Rubber Company; Firestone; Goodyear; Indiana Tire & Rubber Company.

X-Q. 19. Do you handle anything but two-wire tires
876 or the solid rubber tires?

A. The solid two wire, the side wire and automobile tires, and the pneumatic tires of all makes.

X-Q. 20. What was your occupation prior to your becoming salesman for the Chicago Rubber Tire Company?

A. Tire applier for the same company.

X-Q. 21. How long have you been connected with that company and what was your occupation prior to that time?

A. Carriage driver; before that clerk in my father's hardware store.

X-Q. 22. How long were you a carriage driver? 877

A. About two years.

X-Q. 23. Who asked you to attend here?

A. The Diamond Rubber Company.

X-Q. 24. Well, who was it connected with the Diamond Rubber Company?

A. Mr. Harmer.

X-Q. 25. He is the gentleman who has been present here today at our morning and afternoon session?

A. Yes, sir.

X-Q. 26. When did he first explain what you were to testify about?

A. He came to me Tuesday evening about the time I 878 was getting ready to go to supper, and asked if I would testify in the infringement suit pending against the Diamond Rubber Company.

X-Q. 27. And that was the day before New Year's?

A. Yes, sir.

X-Q. 28. Mr. Harmer is the representative of the Diamond Company at Chicago, is he not?

A. Yes, sir.

X-Q. 29. One of defendant's witnesses, Mr. Ludlam, who had had considerable experience in the applying of solid rubber tires of the Grant type, testified as follows: 879

"X-Q. 91. Then if force enough were applied at any point to raise the retaining wire, this underlying rubber would yield to some extent, would it not?

"A. It will.

"X-Q. 92. In other words, this underlying rubber is not a solid mass, and if force enough is applied to the retaining wire on its under side, the wire will ultimately break.

"A. Yes, if you put power enough on it."

Again the witness testified:

"X-Q. 101. Take the case of an inch and three-quarter tire, say, or a hansom cab wheel, if force

880 enough were applied at any given point, say six inches in length, to rock the tire, what particular parts of the tire would be affected by that rocking motion?

"A. About six inches, where you had hold of it."

Now do you agree with this or not?

A. I don't agree with him because if the tire were properly applied you could not insert anything of a sufficient thickness under the base of the rubber and the channel to give it the rocking motion.

X-Q. 30. Then you disagree with him because you don't think it could be demonstrated by getting some-
881 thing thick enough past the rubber or under the base of the rubber to demonstrate the rocking motion. Is that correct?

A. No, sir. Not if the tire is properly applied.

X-Q. 31. Well, that was not the point that I was asking you about. The point was whether the rubber under the wires, if the tire is properly applied, is still compressible to any degree whatsoever, or whether it becomes hard like iron or something of that kind. Now defendant's witness that I mentioned has been examined by Mr. Offield as to the fact that the tire should be applied so
882 that the wires are just as tight as possible, but he (the witness) was willing to conceive that the rubber under the wires would still be compressible. Now do you agree or disagree with him?

Objected to by defendant's counsel as improper cross-examination, and as comparing the opinion of some witness as to the knowledge of a fact testified to by this witness.

Complainants' counsel refers Mr. Offield to his own witness, Mr. Ludlam, X-Q. 83 to X-Q. 92, and states that that is the witness complainant has been referring to.

A. I disagree with him. 883

X-Q. 32. Please explain why you disagree with him?

A. Because the tighter the wires are drawn the harder it makes the base of the tire.

X-Q. 33. But the witness did not disagree with you on that The question is, is the rubber still compressible after you have fastened the wires as tight as you can, or do you exhaust the compressibility of the rubber and make it of a substance like iron, for instance?

A. There is so little give to it that there would not be any resiliency under the wires.

X-Q. 34. Did you ever figure just how much give there would have to be in order to raise the wire at any 884
one point, say the eighth of an inch from the base, assuming your wire is on the wheel and the tire is fastened as tight as you can fasten it?

A. Now I misunderstood that question. Do you mean by inserting something under the wire or under the rubber?

X-Q. 35. No, I do not.

A. I haven't figured the exact amount of strain which it would take to raise the tire an eighth of an inch from the channel after being properly applied, but I have known of some cases where the tire was torn entirely 885
out of the channel by being caught in a switch or frog, thereby breaking the wires.

X-Q. 36. Did you realize that with a wheel 11 feet 4 inches in circumference having a rubber tire on the rim thereof, with the wires fastened as tight as can be fastened, that in order to raise the wire from the base one-quarter of an inch at any one point, that it would only require that the wire at every other point be pressed into the rubber 1/200 of an inch?

Objected to by defendant's counsel as misleading and for the reason that a tire manifestly that has

886 been tightened to its utmost capacity by a tensile strain on the wires that cannot be any greater without the wires breaking, that a strain put upon those wires as indicated in this question when they are strained to the utmost tension would of course break the wires, and for the reason upon a revolving wheel of the diameter identified by the question and the continual and shifting point of contacting strain, no such effect or result could be possible in such wheel as this reciprocating movement between these wires and the fabric and thin rubber portion of the tire lying under such wire; that there could under these
887 circumstances be only a movement of the free protruding contact body of the rubber of the tire.

Complainants' counsel resents the effort to instruct the witness by Mr. Offield's argument and withdraws the question, but instead thereof reads to the witness the testimony of Mr. Offield's expert, Mr. Pond, as follows:

Adjourned to 10 o'clock A. M., Friday, January 3, 1907.

January 3, 1907. Met pursuant to adjournment.
888 Present, same as before.

"X-Q. 115. Assuming 'Pond Drawing No. 1' represents a wheel the size of 'Complainants' Exhibit Defendant's Rubber Tire,' what would be the distance around the wheel from the point marked 1 to the point marked 2?

"A. About 11 feet, 4 inches.

"X-Q. 116. Assume that the tire was raised as indicated in this drawing a quarter of an inch at the point farthest removed from the channel, what would be the compression or the amount to which the wire would be drawn into this rubber in the 11 feet, 4 inches extending between the two points 1 and 2 to accommodate this quarter of an inch rise?

"A. I have estimated this as closely as possible both by careful measurements and computation, and I find that the longer section of wire between the point 1 and 2 extending around the wheel would sink into the rubber at all points an average of 1/200 of an inch, or 1/50 or 2 per cent. of the thickness of the rubber cushion underlying the wires." 889

I show you the drawing referred to by the witness Pond, which enables you to see that he referred to the major portion of the wire as sinking into the rubber an average of 1/200 of an inch. Now do you disagree with him on that, or do you feel competent to figure the matter?

Defendant's counsel objects to this line of examation of this witness and the reading of quotations from the testimony of defendant's expert, as above shown, for two reasons: First, that it is not cross-examination, as this witness is testifying to a question of fact, and the deposition of Mr. Pond was simply as to a matter of theory; second, that Mr. Pond did not testify that any such position or movement of the wires were possible in the exhibit referred to in the quotation, but submitted and discussed the drawing to show the absurdity of complainants' theory of the movement of the wires and the tipping capacity of the wires when strained to their utmost tension. Mr. Pond introduced the exhibit simply as an illustration of such absurdity and stated that mechanically it was impossible for the wires to assume any such position when stretched to their utmost, as shown in the drawing. Mr. Pond in the relevant part of his deposition speaks of any such theory and position of the wire as shown in this exhibit as mechanical nonsense. 890 891

Complainants' counsel calls the court's attention to the testimony of Mr. Pond, and particularly his

892 re-direct examination by Mr. Offield, wherein he stated in answer to R-D. Q. 123, eighth paragraph in the answer, as follows:

> "The clamp test 6 proved, according to the testimony of this witness, that under pressure, such as the load, the wires move inwardly; the test showing an inward movement of over 1/16 of an inch. I see no reason to doubt or question the accuracy of this particular test, and shall accept its results as substantially accurate."

A. I don't agree with him, because that after having the wires drawn as taut as they can be drawn the wire has a tendency to cut into the rubber instead of compress-
893 ing it.

X-Q. 37. In your answer to question 7 you undertook to explain how this rubber tire was applied to the wheel, but to my mind you did not explain it. I call your attention to the answer, asking you to read it and state whether that is all that is done in the application.

A. It was not a full explanation of it because the questioning counsel did not give me sufficient time to finish.

X-Q. 38. Please go ahead and give a full explanation.

A. After cutting our rubber to the exact length re-
894 quired, inserting the wires, we clamp the one end of the wires in the set of jaws; after skiving the ends we insert the other end of the wires through another set of jaws, fastening the ends in a pair of dogs attached to the end of a long worm by means of which we draw the wires as tight as we can get them without breaking. We sink the rubber in the base of the channel; put on compression tongs; put on our closing wires; then proceed to draw it as tightly as we can get it without breaking the wires. After cutting the wires to the exact length we skive the end, make the skived end fit perfectly and braze with a gasoline brazing torch. After the wires are cooled we

have a space left of about 5 inches to close; we put the wheel in the closing machine, clamping the wheel firmly above 12 inches from the open joint; we attach the wires in the set of clamps at the end of a long screw by means of which we close up the open space, closing the joint. When that is finished the wheel is ready to go onto a vehicle. 895

X-Q. 39. You referred to "closing wires;" can't you explain a little more fully what they are?

A. Closing wires are wires which lay under the rubber which we use to draw the compression aforesaid mentioned. This is really part compressed to close the opening, which is probably about 5 inches of the tire, compressed in the space of about 20 to 24 inches. This compression drawn out in 20 to 24 inches brings it back to its normal thickness. 896

X-Q. 40. In your answer to X-Q. 38 you say, "we attach the wires (closing wires) in the set of clamps at the end of a long screw by means of which we close up the open space, closing the joint. When that is finished the wheel is ready to go onto a vehicle." Is that statement correct?

A. Yes, sir.

X-Q. 41. Well, what about the closing wires? 897

A. The closing wires are drawn out from underneath the rubber with a pair of pliers which would complete the operation of applying the tire. Some people in using the table closing machine would cut off the wires as close to the channel as they possibly could, leaving them under the rubber, but my instructions have always been to pull them out.

X-Q. 42. As I understand, you use a piece of asbestos which is placed under the wires prior to brazing the ends of the wires—I refer to the long retaining wires When is that asbestos removed?

898 A. Some tire appliers use asbestos; others use a piece of tin. With a good brazing torch we do not use any. The piece of asbestos you refer to in most cases is removed before the wheel is taken from the applying machine.

X-Q. 43. As a matter of fact you have to take the asbestos or tin from undernath the wires before you pull the ends of the rubber together, do you not?

A. In my explanation of the applying of the tire I did not say that I used a piece of asbestos or tin under the wires while brazing them, therefore did not think it necessary to refer to it.

899 X-Q. 44. Well, assume that your answer to X-Q. 42 stated that with some brazing torches you did use asbestos or tin. Now do you wish the court to understand that you never use asbestos or tin?

A. In most cases of applying of tires I do not use it, but once in a while we have to resort to it on account of not being able to get enough heat on the wires to be brazed.

X-Q. 45. Well, now go ahead and answer my question, which inquired whether in those cases you didn't have to remove that asbestos or tin before pulling the
900 ends of the rubber together.

A. The asbestos which is sometimes used in making a braze must necesarily be taken from underneath the wires before the ends of the rubber can be pulled together, to make a perfect joint.

X-Q. 46. Isn't that asbestos or tin clamped pretty stiff or hard by the retaining wires?

A. It is never clamped to the base of the channel for the simple reason it is taken out before the wires being released from the sets of jaws on the applying machine; the space between the wires at the base of the channel is about uniform with the rest of the rubber.

X-Q. 47. And as a matter of fact when the retaining wires are released from the jaws they do snap down into the channel somewhat, do they not? 901

A. They do.

X-Q. 48. And this is because the clamping jaws do not project sufficiently in the channel to permit the wires to be at their normal position within the channel at the time the ends of the wires are being brazed?

A. No, sir; that is not the reason. When the ends of the wires are brazed they are in normal position, but the wire being drawn so taut would naturally draw the wires to the base of the channel.

X-Q. 49. Well, then, I suppose you mean that the wires have sufficient flexibility or some qualities of that character that enable them to be drawn down closer to the base of the rim after they are released from the clamping jaws. Is that it? 902

A. That is a question that I can't answer, not having made a study of the peculiarities of steel wire.

X-Q. 50. You referred to fastening these wires as tight as you can without breaking them. When in fact do they usually break, if you have such hard luck as that in applying them?

A. The wire breaking is mostly caused by a flaw when we cannot draw the wires any tighter. If we put on more force, such as extra weight, we either break the wires or the machine. The exact explanation as to when they break cannot be given because the length of time of my service as tire applier I have never had the hard luck of breaking them when applying them. 903

X-Q. 51. Did you ever have them break after you had released them from the clamping jaws?

A. Yes, sir; but they generally break in the braze, which necessitiates reapplying the rubber, as before an explanation of which is given earlier in the day.

904 X-Q. 52. Which has been the more frequent experience, breaking the wires before they were released from the jaws or having them break afterwards?

A. My experience has been in having them break after being released from the jaws.

X-Q. 53. I don't suppose that you attribute that to having fastened the wires too tight, do you?

A. I attribute that to the burning of the braze.

X-Q. 54. When the wires break before releasing the wires from the jaws do you then have to reapply the rubber?

A. As I have never had them to break that way but
905 once I reapplied the rubber.

X-Q. 55. That is an easy or a troublesome job?

A. It is just as troublesome as it would be in putting on a new one.

X-Q. 56. Well, isn't it a little more so from the fact that you first have to get the broken wire out of the rubber before you can thread a new wire into it?

A. The old wire can be shoved out of the rubber while inserting new wires, if the ends of the wires do not project beyond the end of the rubber.

X-Q. 57. Well, Mr. Koenig, don't you think it is a
906 fair statement to say that an operator tries to avoid just such an occurrence by not fastening the wires so tight as to approach too near the breaking strain?

A. If he does not draw his wires as taut as he can possibly get them it causes a continual creeping of the rubber around in the channel, eventually having the rubber revolving around in the channel and the wheel revolving in another direction.

X-Q. 58. Then I understand you that your experience teaches you that unless you are careful to get the wires just as tight as you possibly can without breaking the

wires the entire rubber will creep, as explained in your previous answer. Is that true? 907

A. Yes.

X-Q. 59. Now, referring to the closing wire, please explain what size wires you usually have used and how many of them.

A. We use four lengths No. 14 annealed iron wire about 12 inches long.

X-Q. 60. With the inch size of tire what is the size of the retaining wires?

A. Some people in applying a 1-inch tire would use No. 12 wire, high carbon; others would use No. 11; some 10½; but the sized wire must be determined by the hole in the rubber to which they insert the applying wires. I always use the heaviest I can. 908

FRED C. KOENIG.

Thereupon defendant called, in defendant's behalf, MR. CHARLES H. SMITH, who being duly sworn, testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Charles H. Smith; 34; 21 Airdrie place, Chicago, Illinois; Chicago manager of the Diamond Rubber Company. 909

Q. 2. How long have you been such manager for the Diamond Rubber Company, and is it the Diamond Rubber Company of Ohio or the Diamond Rubber Company of New York?

A. Diamond Rubber Company of Ohio. One year ago the 20th of December last. I have been in the employ of the company seven years this coming March.

Q. 3. At what place or places, and in what capacity?

910 A. Most of the time traveling representative of the Chicago branch, in the State of Indiana.

Q. 4. Are you familiar with the solid rubber tire of the Grant patent in suit as shown and illustrated by the drawings of this patent before you?

A. I am.

Q. 5. When did you first become familiar with the tire of this patent and its method of application to a wheel rim as shown in the patent?

A. In March, 1901.

Q. 6. From March, 1901, to the present time state whether or not you have not only been familiar with the
911 tire itself but with the manner of application and use of the tire upon various kinds of wheeled vehicles.

A. Not only have I been familiar with the use of the tire from the date just mentioned, but during the first years of employment by the Diamond Rubber Company I assisted in installing machines for the application of a tire of the two-wire type in the factories of the various concerns that I was successful in selling the Diamond tire to.

Q. 7. Did you actually assist during those years to any extent in the application of the tires by these machines to the wheels of various kinds?

912 A. I assisted but did not do the work wholly, the manual labor being done by the shop operators under my personal direction, I pointing out the quickest and easiest method of application of the rubber and recommending the quality of wire, length of brazing scarfs or bevels piled upon the ends of the wires, and as to various methods of drawing out the compression after the said wires had been brazed and made endless; also as to the tightness the rubber should possess after the work of applying had been completed.

Q. 8. During the last seven years, or since 1901, please state somewhat in detail the exact manner or method you

employed or directed to be employed for fastening these 913
tires into the channel rim by the machines sold by you for that purpose, and in this connection first give a brief description of the machines themselves.

A. First, I always determined a diameter of the wheel to which the rubber was to be applied, then having a regular schedule of lengths of rubbers for the wheels of various sizes, the schedule, by the way, allowing a compression of 6 inches, that is to say, that the rubber tire that I was to apply to the wheel was 6 inches longer than the circumference of the said wheel at the channel base or tire seat. I immediately laid the piece of rubber straight on a bench and inserted wires in each of the holes in the 914
body of the tire provided for that purpose, leaving same protruding from each end of the rubber tire in question about 12 to 18 inches; then we scarfed or beveled in a vice prepared to hold same the wires on one end of the tire only. This end with the ends scarfed or beveled we placed in a clamp of the applying device; the particular device these ends were clamped in the clamp on the right-hand side of the machine. Then the wheel was hung by the wooden felloe on an arm projecting below these clamps for that purpose. The rubber tire with the wire inserted in same was wrapped around the wheel as it 915
hung on the arm and the wire ends put through the clamp on the left-hand side of the machine and running through holes provided for that purpose in the right-hand clamp or jaws into a couple of grips or clamps that were on a screw on the right-hand side of the machine. This screw was provided with a wheel and threaded to same. The next move was to stretch the wires taut by turning this wheel with the right hand. This operation not only drew the wires tight, but at the same time forced the compression of the rubber evenly throughout its entire length or nearly so, the compression being held back by

916 the jaws on the left-hand side of the machine through which the retaining wires was being drawn by the screw in the wheel as just described. After drawing the wires as tight as it was possible to do so without breaking, with a wrench I screwed up the clamp on the left-hand side of the machine through which the wire had been drawn in the process of tightening, thereby holding the wires on the left-hand side tight and absolutely secure without the drawing-up device of wheel and screw and clamps on same. Now the wires are filed off at a point about the middle between the left and right hand clamps or jaws and beveled or scarfed to an angle that corresponds to
917 the ones on the ends of the same wires held in the right hand jaws of the machine. All this time the rubber is being held apart and the compression kept from forcing it together by the two jaws or clamps holding the end of the wires. Then we carefully made the joints of the wires even hammering the same together to a nicety, inserting a piece of asbestos paper between these wires and the base of the channel; heated the laps of this joint on each wire red hot with a gas blow pipe or gasoline torch whichever we were using and brazed them together in the ordinary manner with brazing spelter and
918 common brazing compound, usually borax. After waiting some 4 or 5 minutes for the wires to cool we removed the asbestos paper; tried the joints of the wires with a cold chisel and hammer to see that we had made a secure joint; then released the clamps that had previously held both ends of the wires on the right and left sides of the machines and the said wires which had been held by the jaws some little above the channel base, probably a matter of a sixteenth of an inch above the channel wings immediately dropped into place and the wheel was removed from the arm on which it had been hanging during the operation. The next move was to

force the ends of the rubber together where the compression had been held apart by the jaws holding the wires during the brazing operation. There were several appliances used for this particular work, but the one with which I had the best success was in the form of a frame or yoke, the wheel being placed on a spindle, allowed to hang in the frame, and a roller with a ratchet attachment operated by a lever giving great pressure on the tire itself being forced down onto same. Then we would take hold of the wheel by the spokes and turn it, the steel roller just described bearing down on the rubber making more or less friction between the roller and the rubber which would take out the compression and close the opening a little bit at a time; before it was finally drawn up and the ends of the tire butted together we would apply a little rubber cement on each end of the rubber tire so that when they were finally brought together they would after a short time be cemented. Since actively engaged in setting up the tire machine there has been brought out a new drawing up device which is different from the one just described, but with which I am familiar. It is composed of a spindle placed in a post or any upright wall adapted to the purpose on which the wheel is hung by the hole through the hub. The lever running out from the spindle has a jaw or clamp attached to the same and adjustable on same, adjustable to wheels of different diameter. After the wheel is placed upon the spindle this jaw or clamp on the horizontal bar is clamped tight on the felloe of the wheel to prevent same from turning, this being on the right hand side of the wheel as you stand facing it while it hangs on the spindle driven in the post. Now on the opposite side of the wheel another lever projects and there is a clamp on this that grips the rubber tire, the wheel of course being held stationary by the first clamp

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922 just described. This last clamp is tightened up so that it grips the rubber tightly as possible without injuring it. It is pulled forward with a third hand lever working on a ratchet to prevent slipping backward, this last clamp of course being tightened up on the rubber, pulled the rubber forward and eventually brought the ends together though it did require several operations before the ultimate result was achieved, for had a clamp been so tight that it would not slip it would have materially injured the rubber tire, inasmuch as it was the rubber tire itself that moved and not the wires. We always endeavored to get the wires so tight that there was no
923 possibility of the wire and tire moving together during the drawing up operation. If there had been any of this one could readily see how you could have kept revolving them both around the wheel indefinitely without ever closing the joint.

Q. 9. Have you those machines with you that you have just described that are actually used in this country for placing and clamping the wires and tires in position on the wheel rim?

A. I have the machines I have described, with the exception of the first drawing up device which was a
924 home made affair.

Q. 10. Are these machines in common use?

A. I believe they are. There are however, several makes of machines. The Sweet Tire & Rubber Company have a machine which bears their name; the machines I have described are manufactured by the Nelson & LeMoon Company of Chicago, which I believe are recognized as standard, where the wires are brazed in applying tires. They made both of the machines, the one for applying and the other for drawing up the rubber after it has been applied to the wheel.

Defendant's counsel here offers in evidence the

two machines described and identified by the wit- 925
ness and requests that they may be marked respectively "Defendant's Exhibit Standard Internal Wire Applying Machine" and "Defendant's Standard Joint Closing Machine."

Q. 11. In applying the tires with these two internal wires, as you have described, was equal tension put upon the wires in applying the same, by this machine?

A. Absolutely equal.

Q. 12. What force or tension was put upon these two internal wires in locking the tire to the wheel as compared with the tensile strength of each wire?

A. We never made a test of the wire as to tensile 926
strength, but the wires were drawn as tight as possible to make them without breaking.

Q. 13. Mr. Smith, approximately, during the last seven years, how many of such tires have you seen and known of being applied to wheels by these two internal wires with substantially this kind of a machine?

A. Feel safe in saying I have immediate knowledge of some 25 to 35,000 sets put on by the various buggy manufacturers and their agents. Of course I have not seen all of these applied, but as a salesman can make a close estimate of the rubber tires used in the territory 927
through which I traveled.

Q. 14. Please state whether or not it is possible for these wires to move in any way either by tipping or rising or falling in the channel by any of the extraordinary and severe strains of travel or usage of the wheeled vehicle to which they are applied; in other words,—is it possible for these wires to adjust themselves by any kind of a movement in any way by any strain tortion or twist that is put upon the exposed body of the rubber of the tire in travel?

Objected to as leading.

928 A. No, not if the tire is properly applied and the wires are tight enough. To overcome a possibility of this kind and to be sure that the wires remain tight and firm I always recommend the use of a high carbon wire, a wire that would not stretch.

Q. 15. Did you ever know or ever hear it claimed by any user of these tires, when applied by the machines you have described to wheeled vehicles,—did you ever know or hear it claimed that such a tire had any capacity to tip in its channel or rise or fall when subjected to severe lateral or side thrusts, or any twisting action in traveling upon or over the street car tracks used in
929 the city?

Objected to as immaterial.

A. Only in the nature of a complaint that the tires were not applied tight enough to the wheel. I have known of cases where a complaint of this nature has been made and the tires had to be reset.

Q. 16. What is the object then of locking and clamping these internal wires and the tires so tight in the channel by straining the wires to the extent you have described?

A. To prevent the tires from slipping in the channel.
930 The tire I always recommend must be applied so tight that it must be a part of the wheel itself.

Q. 17. Do you mean by that that the wires clamp the base of the tire so tightly to the rim that the wires and the base of the tire cannot move any more than the rim?

A. I do.

Q. 18. Have you had made, or have you here present a wheel equipped with rubber tires with the two internal wires as you have described and by the two mechanical devices just offered in evidence as exhibits?

A. I have one.

Q. 19. Is this it?
A. It is. 931

Defendant's counsel here offers in evidence the rubber tired wheel just identified by the witness and requests that the same may be marked "Defendant's Exhibit a Standard Rubber Tire Wheel."

Q. 20. I notice in this exhibit that there appears to be two mutilations of the wheel, first one of the flanges of the rim is cut away flush with the bottom of the channel for about four inches, and second, the rubber tire itself is cut away flush with the periphery of the rim and exposing the wires for a distance of about six 932
inches. For what purpose was this done?

A. The first cut of the rim of the channel is made to demonstrate and show how tight the base of the tire should fit the base of the channel, also to show that when a tire is properly applied how difficult it is to force the base of the rubber from the base of the channel. Where the tire has been cut away on the top down to the retaining wires this was done to show also how tight the wires are drawn when a tire is properly applied, and also brings attention to the fact that it is the resiliency of the rubber in the tire itself above the wires that part which is directly exposed to wear and tear that moves 933
back and forth, and that the tire below the wires and the wings of the channel does not move, or rock in traveling.

Adjourned to 10 A. M., January 4, 1908.

January 4, 1908: Met pursuant to adjournment: Present: Same as before.

Q. 21. In examining this last exhibit at the point where the flange is cut away substantially flush with the bottom of the channel I notice that by striking or moving with the hands the rubber tire at that point that the

934 tire seems to give and might convey the impression that the wires also moved or give with any pressure, even a hand pressure, that is put upon the tire itself. Would you kindly take your knife and cut away a small opening in the rubber near its base and opposite one of these clamping wires so that it can be seen whether any pressure put upon the rubber or tire, such as it would meet in severe travel, would in the slightest move or disturb the clamping wires themselves.

A. I will endeavor to cut the rubber as suggested.

Q. 22. Have you done so?

A. I have.

935 Q. 23. In any hand pressure, no matter how powerful that you can put upon the rubber above this cut away portion, or adjacent to it, can the wire be made to move in the slightest?

A. The wire cannot be moved.

Q. 24. You spoke in one of your answers as to the use and instruction of use by you of a high carbon wire, a wire that would not stretch when clamped in position in the tire as described by you. What is the characteristic of such high carbon wire where that condition exists?

936 Question objected to as calling for opinions or assumptions and on the ground that the device which Mr. Offield has in his hand is the best evidence.

A. By comparison of what is known of soft or low carbon wire it can readily be seen that high carbon wire is stiffer, harder to bend, consequently will not stretch in the machine when same is being drawn up before brazing, also that it will not break when the severe drawing up strain is put upon it. The first six months of my employment with the Diamond Rubber Company we endeavored to use soft wire but experienced great difficulty in the wire breaking or stretching as just

described. After that time I always recommended high carbon wire and had no more trouble in this direction. 937

Q. 25. I hand you what appears to be a section or sample of rubber tire with two internal wires running through it in sections and ask you what this sample illustrates?

A. The sample shows itself to be about a 6-inch length of internal wire tire, the size I should say to be known as inch and a quarter and manufactured by the Diamond Rubber Co. There are two pieces of wire inserted in the holes of sample section of the tire, the smaller being what is known as low carbon or soft wire, the larger or heavier gage being what is known as high carbon or hard wire. 938

Defendant's counsel here offers in evidence the tire and wire section identified by the witness and requests that the same may be marked "Defendant's Exhibit Tire High & Low Carbon Wire."

Q. 26. Which of these wires is present in "Defendant's Exhibit a Standard Rubber Tired Wheel?"

A. The high carbon or hard wire.

Q. 27. In your experience and with your knowledge of these internal wire tires, state how and in what manner these tires are destroyed and renedered useless, otherwise than by wear by use on the tread of the tire? 939

A. By the action of the rubber on the stationary wires working from the inside towards the outside. That is to say, the constant straining and flowing of the rubber in actual use on the wheel of the vehicle pulling away from the wire and eventually enlarging and cutting and tearing out the rubber at the sides or bottoms of the holes through which the wire is inserted, until it breaks through to the outside or base of the tire as the case may be.

Q. 28. What proportion, approximately, of these

940 Grant tires, to your knowledge, wear out in actual use, by the rubber being worn down to the channel iron in distinction from being destroyed by the cutting out of the rubber on the sides or bottom of the contacting base?

Objected to as immaterial and as calling for a mere assumption on the part of the witness.

A. My personal observation has shown me that the percentage is very small. Would say somewhere between 5 and 10 per cent. Much depends as to the use to which the vehicle is put, and the conditions under which it is run or operated and used.

941 Q. 29. In your extensive knowledge of the application and use of these two internal wire Grant tires have you become familiar with the fact as to whether or not it is a fact that these solid rubber tires become fastened by rust or by a species of cementing of the bottom of the tire to the base or bottom of the channel rim?

Objected to as leading, as indefinite, and immaterial.

A. I have seen any number of instances where the base of the tire has rusted and stuck fast to the base of the channel and always where the tires have been properly applied and kept tight during the period of their

942 service.

Q. 30. Mr. Smith, during your first experience some seven or eight years ago with these two internal wire tires, what did you ascertain, if anything, by coming to your knowledge, in any way, of tires before that time of this character being cemented at their base in the rim channel in addition to the tires being held in position with the two retaining wires?

Question objected to as calling for secondary evidence, and as immaterial.

A. In soliciting business for the Diamond Rubber Co. in the first year or two of my engagement with them

and in my work of installing the machines for applying two wire tires there was called to my notice in the various shops where I visited the old method of applying two wire tires. A soft wire was used and joint of same were twisted together. That is the wires and tires made endless before being applied to the channel of the wheel. Then I was told that the tires and wires were sprung over the edge of the channel, being forced over with levers and clamps. It was called to my attention that this method was unsatisfactory, inasmuch as it was practically an impossibility to get the internal circumference of the two wire tire on the inside or base to conform tightly enough to the base of the channel and still be able to force it on in the manner just described, and to overcome this inequality of circumferences and prevent the tire from slipping, a cement of some kind was used between the base of the tire and the base of the channel. I have never personally seen this method of applying tires employed, however. 943 944

In addition to objections as noted, answer objected to as in part hearsay.

Q. 31. Are you familiar with the two external wire tire that is known commonly in the market to the trade as the Firestone Side Wire Tire? 945

A. I am perfectly familiar with that.

Q. 32. Have you a wheel present that is so tired.

Question objected to as immaterial.

A. I have.

Q. 33. Is this it?

A. This is it.

Defendant's counsel here offers in evidence the wheel identified by the witness and requests that the same may be marked "Defendant's Exhibit Firestone External Side Wire Tire."

Q. 34. I see that this tire or rather the channel rim

946 containing the tire has been cut away at one side for about four inches, so as to expose one of the side wires. When was this done and for what reason?

A. This exhibit was prepared by my blacksmith at my request, and the rim of the channel cut away to show how utterly impossible it is to raise the base of the tire from the base of the channel, also to show that the giving or flowing of the rubber tire itself is in the rubber itself and does not in any way move the retaining wires.

Q. 35. Are these retaining wires of this external wire tire before you stretched and locked in position on the wheel in the same manner or to the same extent as the
947 tires of the Standard Internal Wire Wheel Exhibit Wheel before you, and if not what is the difference?

A. The retaining wires in the instance of the side wire type of tire are made endless before the tire is applied to the channel. We have a regular schedule of lengths and circumferences for brazing up these endless wires, and same are forced over the edge of the channel by very powerful clamps and levers. There is practically no compression in the rubber tire as shown by the side wire type.

Q. 36. State if you ever heard it claimed, or ever
948 knew yourself that in these two external wire Firestone tires, these wires rose and fell or readjusted themselves or tipped in any way in the extreme strain and travel of the wheel under the most trying conditions of use.

Objected to as immaterial.

A. Absolutely no movement of the retaining wires, if the tire is properly applied.

Q. 37. To what extent are these external wire tires, as shown by this last exhibit, now in use in this country?

A. In the sizes of inch and a quarter and over on transfer buses, and coaches, heavy carriages such as broughams, etc., also on fire apparatus.—I would say

that 75 per cent of such vehicles in the territory with which I am familiar are now equipped with tires of the Firestone side wire tires. The fire apparatus, such as engines, hose carts and ladder trucks, do not, as far as I know, at this time, use anything but the side wire tire. In my early experience in the rubber tire business I tried without success to apply tires of the internal wire type to vehicles of fire apparatus. 949

Q. 38. I judge from what you say, then, that in the external wire type of tire, as shown by this exhibit,—the strain upon the rubber in every way is much more severe in actual use to lift and re-seat the wires if such a thing were possible than in the internal two wire tires, how is this? 950

Question objected to as leading and immaterial.

A. My personal experience has taught me that such is the case.

Q. 39. To arrive at the fact in a different way,—please state why these internal wire tires of the Grant patent have been abandoned and the external wires like the exhibit before you substituted for them on the different wheeled vehicles you have described?

Objected to as leading and as calling for mere assumption on the part of the witness. 951

A. My personal experience has shown me that when a two wire tire of the Grant type was used on heavy vehicles just described, the shearing strain and the tendency of the rubber to cut out and pull away from the tightly stretched internal retaining wires, was very great. The constant rolling and straining of the rubber on the tight internal wires being very great, due to the weight of the vehicle and the large size of the tire, the holes in the rubber being large and cut out very, very quickly, if not through the sides always through the base, or both. I have seen some instances that a whole top

952 of the tire above the internal retaining wires has been wrenched off leaving the wires exposed for a matter of eighteen to twenty-four inches, and at the same time there was no appreciable wear on the tread or face of the rubber tire where it came in contact with the pavement in service, and all this happening in a very short space of time, as is evident by the condition of the face of the tire just mentioned.

Objected to as stating assumptions of the witness.

Q. 40. I notice in these various wheel exhibits here in evidence, and especially in the last exhibit that the wheels are to a certain extent dished. To what extent
953 if at all does this dished character of the wheel have upon the rubber tire or the wear of the tire in actual use? I mean does this dishing of the wheel have any relation to the wear of the tire directly upon the crown of the tire, or an even wear of the tire in use?

A. If the tire is properly applied it does, that is if the tire is always tight as it always should be. A wheel that is dished will bring the rubber tire in contact with the street off to one side, that is to say the wear of the tire will not be even and straight on its tread or face. In this case it must be seen that the retaining wire on
954 the side receiving the most strain and directly under the surface of the tire coming in contact with the street, would probably cut through first.

Q. 41. In your opinion, what effect would a lateral blow or thrust of the wheel have upon the dished character of the wheel if such blow or thrust was given at a point directly above the rim channel of the wheel at its base in traveling. What I am trying to get at is, if a severe lateral strain was put upon the wheel at this point would the wheel dish or yield before the retaining wires or clamping wires would let loose their hold upon the tire, or themselves yield?

Question objected to as leading and the court's attention is called to the character of the cross-examination of this witness as relating to assumptions of the witness and therefore immaterial. 955

A. I have never seen an instance where the wires were in any way affected by a blow of the kind just described.

Q. 42. You have spoken of the tires of the Grant type being practically cemented to the channel of the rim by moisture or rust in use, and you have now spoken of the dished character of the wheel. Have you here present a wheel that illustrates both of these conditions you have just described? 956

A. Yes I have such a wheel.

Objected to as immaterial.

Q. 43. Is this it?

A. It is.

Defendant's counsel here offers in evidence the wheel identified by the witness, and requests that the same may be marked "Defendant's Exhibit Dished and Naturally Cemented Rubber Tire Wheel."

Complainant's counsel calls the attention of the court to the adroit title given the exhibit. 957

Q. 44. Does this last exhibit also illustrate the manner in which the tire is cut or torn from the clamping wires without moving the wires?

A. It does.

Q. 45. I notice that in all of the exhibits heretofore offered in evidence,—the wheel exhibits,—that the tires appear to be new and unchanged by pressure or wear, and with what I will speak of as a prominent rolling crown in the rubber. Please state whether such formation of tire represents the actual shape of the tire after

958 it has been used for any length of time, or when it is used under a heavy load?

A. The new tires do not represent condition of the tire after, say, a year's service, for of course the rubber tire in service on the vehicle if tightly and properly applied wears down in the course of time, reducing the height of the tire above the base of the channel very materially, and relatively as the height of the rubber is lessened above the two retaining wires the leverage and pull and strain of the rubber upon the two retaining wires is lessened.

959 Q. 46. Calling the attention again to the Exhibit Two Retaining Side Wires Firestone Tire, are the two side wires in that tire high or low carbon wires?

A. They are hard high carbon wires.

Q. 47. In this last dished exhibit offered in evidence, can you tell whether these two internal clamping wires are high or low carbon?

A. I cannot without filing same, and testing as regards their flexibility, and comparing them with wires that are new and of the various degrees of hardness.

Q. 48. You have testified as to the effect of use of the wheels containing the new tires as to the shape of
960 the tire. Please state that when these tires are new as shown on the wheels what effect upon the shape of the tire has the placing or carrying of the heavy load upon the tire?

A. The load upon the tire had a tendency to squeeze the tire down. That is, flatten it out and make its contact at the traction surface greater and wider than when without the weight of the load. The action of the load in this respect effecting the rubber alone and in no way changing the position of the two internal retaining wires.

Cross-Examination by Mr. Bowman. 961

X-Q. 49. You have been attending here for the past few days constantly have you not?

A. Thursday, January 2nd, I attended about two and one-half hours in the morning, only; Friday, January 3rd, about one and one-half hours in the morning and two hours in the afternoon; Saturday, January 4th, two hours in the morning, consequently not present when all testimony was taken.

X-Q. 50. Do I understand that you applied or superintended the applying of the rubber tires on both the exhibits Standard Rubber Tired Wheel and the Fire- 962
stone Rubber Tired Wheel?

A. Personally I directed the application of the internal wire tire only. The exhibit of the side wire tire was merely prepared in compliance with my orders.

X-Q. 51. Do I understand that you saw the Firestone tire applied?

A. I did not.

X-Q. 52. Have you been instructed to keep account of the expense of the wheels and rubber tires that you have furnished here?

A. I have not. Instructions of that kind are not 963
necessary. I have general instructions from the home office and a system by which I account to the home office for all material used as samples, the same being charged to sample account, or such other account as the home office may see fit to charge same to when they receive my memorandum of material that I have drawn from my stock here at the Chicago branch of the Diamond Rubber Company.

X-Q. 53. Do you keep any patent expense, or patent litigation account?

A. None here in Chicago and I know of none at

964 Akron. I am not familiar with all of the accounts to which the Diamond Rubber Company charge their various expenditures.

X-Q. 54. Have you not paid out money during the last week on account of this testimony?

A. I have not.

X-Q. 55. How about your time. Have you a system of keeping a record of your time and Mr. Harmer and do you charge it separate in a matter of this kind?

A. I have no record or account to which I could make such charge, nor do I keep any record of Mr. Harmer's time in this regard. The home office at Akron
965 charges all of Mr. Harmer's time and expense to the Solid Tire Department. As regards my own time I as Manager of the Chicago branch look after the general business of same, including solid tires, pneumatic tires of all kinds and mechanical rubber goods, and do not believe that the home office divides my salary and expenses up among the various departments.

X-Q. 56. Comparing the two wheels here, to-wit: the Firestone External Rubber Tire Wheel and the Standard Rubber Tired Wheel Exhibit, are you prepared to say that there is any appreciable difference in the tightness
966 of the wires in those two exhibits?

A. I believe the retaining wires in the rubber tire in the Standard wheel are probably tighter than those on the tire of the Side Wire Firestone type.

X-Q. 57. Have you any way of determining this exactly?

A. I have none. Merely an opinion.

X-Q. 58. Would you say that the wires in the Firestone tire were sufficiently tight to be considered as properly applied?

A. Yes.

X-Q. 59. What instructions did you receive as to

applying the rubber on the wheel of the exhibit Standard Rubber Tired Wheel,—I mean simply as to how tight you should fasten the wire? 967

A. No instructions at all other than to set a tire the way that I would recommend a rubber tire be set to give the most satisfactory service.

X-Q. 60. And you had explained to Mr. Offield that you were accustomed to recommend a high carbon wire to be used, and that the wires should be fastened as tight as they possibly could, had you not?

A. I had.

X-Q. 61. What is the circumference of the wheel of the Standard Rubber Tired Wheel Exhibit compared with the circumference of Complainant's Exhibit Defendant's Rubber Tire, being the tire on the wheel at the other end of this room. I mean simply to state about how the circumference of these two wheels compare in length? 968

A. The circumference wheel of the Standard Rubber Tire Wheel is approximately 9 ft. 9 inches.

X-Q. 62. Are you able to state what the circumference of the other wheel is?

A. I am not.

X-Q. 63. It is considerably larger is it not? 969

A. Apparently, yes.

X-Q. 64. What size of tire do you call this on the Standard Rubber Tired Wheel Exhibit, and what size is it on Complainant's Exhibit Defendant's Rubber Tire?

A. On the Standard Rubber Tire Wheel Exhibit the rubber tire is of the size known as one and one-quarter inch and so marked. I should say the rubber on the other wheel is what is known as one and five-eighths inch in size.

X-Q. 65. What is the thickness of the rubber below the wires in this rubber tire on the exhibit Standard

970 Rubber Tired Wheel, and the thickness of same on complainant's Exhibit Defendant's Rubber Tire?

A. On the tire on the Standard Rubber Tired Wheel Exhibit the thickness of the rubber below the bottom of the holes for the retaining wires is approximately one-quarter of an inch. On the Complainant's Exhibit Defendant's Rubber Tire it is approximately a quarter of an inch, a little scant if anything. Both samples that I have measured, however, show the rubber relaxed and in all probability when the retaining wires are stretched tight, as is the case when the rubber is applied to the channel on the wheel the retaining wires sink into the
971 base of the holes and the thickness of the rubber, consequently below the wires and between the base of the channel and the bottom of the wires is somewhat reduced.

X-Q. 66. Can you state from examining the exhibit wheel of Standard Rubber Tire and particularly at the opening where you cut through to the wire as to what the thickness of the rubber is at the bottom of the opening or the bottom of the wire?

A. No I cannot.

X-Q. 67. Does it seem to your eye to be greatly
972 diminished in thickness from what the rubber is when relaxed as in the sample?

A. Not greatly but slightly.

X-Q. 68. What is the fact as to whether your company handles your own make of your rubber tires exclusively or whether they are accustomed to handle other makes of other solid rubber tires, as well as pneumatic tires?

Objected to as immaterial what the company of this witness does as to this matter.

A. I have never sold anything nor handled anything that the company don't put up.

Adjourned until 2 o'clock.

Re-Direct Examination by Mr. Offield. 973

R-D. Q. 69. Mr. Smith what have you to say as to the quality of the rubber being improved and its lasting quality as to compound in these two wire solid rubber tires since you first became acquainted with such tires seven or eight years ago.

Question objected to as not proper re-direct and as immaterial.

A. We have had and I have seen various compounds, consequently various degrees of hardness affecting the resiliency and elasticity of rubber made for the purpose of rubber tires. It has been my experience that a stock 974
of high grade, that is a stock free from reclaimed rubber, commonly called shoddy, and cured to the proper degree of hardness, would resist the shearing strain on the wires longer and much better before breaking through, consequently would wear longer on the surface exposed to traction.

R-D. Q. 69*a*. The question went a little farther than this, and that is, state whether or not this improvement in the rubber compound for wheel tires has been made since you first became familiar with the tires some seven or eight years ago?

975

Objected to as leading.

A. Yes it has, taking into consideration the selling price that we were able to obtain for rubber tires during the past few years.

R-D. Q. 70. The rubber tires on three of these wheels that appear to be exhibits appear to be tires without wear or use. Assuming that these tires will stand around in a room for the next year and a half as they are here present, will the rubber in these tires deteriorate to any appreciable extent.

Question objected to as immaterial and improper re-direct.

976 A. It probably will somewhat. The rubber will bloom on the surface, the term commonly used by a rubber man, which to the layman would appear as a sort of a white frosting on the surface of the tire exposed to the air. Much would depend, however, upon the temperature of the room or place of storage in which the wheels equipped with the rubber tires were kept.

R-D. Q. 71. What would this blooming of the tire mean, either as to the strength or resiliency of the tire?

A. To me it would mean practically nothing at a point slightly below the surface exposed to the air.

977 R-D. Q. 72. In this Firestone External Wire Exhibit I see that there are lateral or small cross wires embedded in the tire upon which the two external wires ride or rest. In any lateral thrust put on the exposed portion of the tire state whether or not the lifting power of the rubber on the two external wires would or would not be increased by these cross wires?

A. Cross wires to which you refer are applied in the Firestone type of side wires before the rubber is cured in the molds, by cured I mean vulcanized. These cross wires which extend through the base of the side wire tire, and on which the two retaining side wires rest

978 at the end, are consequently vulcanized into the body of the tire itself, consequently any movement of the rubber carries the short cross wires with it, but in no way affects the retaining wires.

R-D. Q. 73. Who makes in this country the channel irons which are used as the rims on the wheels for these solid internal and external two wire tires?

Question objected to as improper re-direct and utterly immaterial.

A. Most of the channel is now made by the Carnegie Steel Company. A part of the United States Steel Corporation, and I am told at several of its plants, probably

at the present time mostly at Youngstown, Ohio, Jones & Laughlin Company, Limited, also manufacture standard channel for rubber tires. 979

R-D. Q. 74. In what shape are these channel irons for rubber tires sold to the trade?

A. They are carried in stock in straight bar lengths by nearly every jobber that I know of in steel and iron and heavy hardware and every jobber in carriage material that handles common flat steel tires. We have never recommended anything but standard channel, the same as produced by the Carnegie Steel Company.

R-D. Q. 75. In what shape are the rubber tires themselves sold to the trade? 980

A. At the present time they are sold in reels containing lengths running from 150 to 500 feet, they are then cut up as the customer may require in proper lengths for the various sized wheels to which the rubber is to be applied. Previous to the adoption of the long lengths on spools or reels it was customary to carry the rubber tire stock in coils of various lengths adapted for wheels of various dimensions.

Adjourned at 2:30 to Monday, January 6, 1908, at 10 A. M.

981

Chicago, Illinois; January 6, 1908. Met pursuant to adjournment. Present: Mr. Paul A. Staley for complainants and Mr. C. K. Offield for defendant.

R-D. Q. 76. Mr. Smith from your extended seven or eight years experience with these two wire internal tires as exhibited before you to what do you attribute essentially or what is the essential characteristic or characteristics of these rubber tires that have made them acceptable to the purchasing public and the ultimate user of these tires?

Question objected to first as not proper re-direct

982 and second as calling for conclusions and opinions, the witness not having qualified as an expert either in the characteristics of rubber or of the wire or of the special modes of operation or capacities for operation, hence any opinion which he may express would be incompetent and immaterial.

A. Careful application; drawing up the wires very, very tight; the use of what is known as hard or high carbon wire; the ability of the rubber tire itself to resist wear; also of the rubber in the tire to resist the strain and pull upon the tight retaining internal wires, and I attribute their use in a general way to what we might
983 say prosperity of carriage owners and a desire to attain greater comfort in riding in carriages equipped with rubber tires than was possible with the old steel tire, or wheels not equipped with rubber.

R-D. Q. 77. Mr. Smith I call your attention now specifically to Defendant's Exhibit a Standard Rubber Tired Wheel, and more specifically to that section of the wheel rim about four inches in length upon one side that has been cut away, and to the small cut away or chamfered out portion of the tire itself which you produced with your knife so as to expose one of the
984 internal wires, and as I understand for the purpose of showing that the wire is not disturbed by any lateral pressure by the hands or otherwise upon the exposed portion of the body of the tire above the flange—and calling your attention to the fact that the wire itself can be slightly raised or flexed by inserting under it a cold chisel, or a screw driver and using the leverage thus obtained—and ask you if it is possible to obtain any such prying up or jacking up movement of the wire in actual travel under the most severe conditions which the wheel is subjected to in travel?

Question is objected to upon the same grounds

and for the same reasons stated in objection to question R-D. Q. 76 and it is further objected to as stating a condition or fact exactly contrary to what the witness has already testified to be a fact with reference to the possible movement of this wire, hence any conclusion which the witness may state is very immaterial and incompetent. 985

A. I still maintain that the internal retaining wires would remain taut and not be moved in any way by any strain or contact that might be had upon the rubber tire in actual service when the wheel is on a vehicle. As regards lifting same or moving same with a screw driver or a cold chisel or a lever it will be noticed that to do this the screw driver or cold chisel must be inserted under the wire or under the base of the tire, both of which are points not exposed to strain while the wheel is in service on the vehicle. It would be possible to lift most any weight with a leverage of the kind just described, even to the extent of tearing the wire itself from the base of the channel if it were fastened to it in any way. 986

Answer objected to as stating conclusions and argumentative and incompetent and immaterial.

R-D. Q. 78. This is a seventeen-story brick building in which this testimony is being taken. Would there be any difficulty from your ordinary knowledge of such matters in lifting this entire building with the equivalent leverage of jack screws applied beneath it and turned by hand? 987

All the foregoing objections are repeated,, the question being incompetent and immaterial.

A. There would be no difficulty at all in lifting the building just described, and I happen to know the Majestic building in this vicinity is today resting on jacks and has been brought up plumb by the use of very powerful leverage and jacks.

988 *Re-Cross Examination by Mr. Staley.*

R-X Q. 79. Are you an expert in rubber, Mr. Smith?

A. No, I am not.

R-X Q. 80. Do you know whether rubber is compressible to the extent that it may be made denser under pressure?

A. In certain compounds it is. Some compounds are more susceptible to pressure than others.

R-X Q. 81. How about pure rubber, is it compressible in the sense of being able to make it denser under pressure?

989 A. Cured or uncured?

R-X Q. 82. Either. You may describe what you mean by cured and uncured?

A. I have never seen any pure rubber cured. Cured rubber, such as used in a rubber tire, and for other purposes has been compounded with other materials such as different oxides of metals, oftentimes reclaimed rubber or shoddy, oils, and always sulphur, the chemical action of which must always be present when rubber is cured, or vulcanized, which is the proper term; not being a rubber chemist I cannot give the names of the oils, oxides and other material that enter into the various 990 compounds nor the proportions of which enter into same. These are all secrets of the rubber manufacturer's chemists and closely guarded.

R-X Q. 83. Then your idea of cured rubber is the same as compounded rubber, or rubber compound?

A. Yes, all cured or vulcanized rubber must be compounded, that is, at least to the extent of having sulphur in same or it would not cure or vulcanize in the heat.

R-X Q. 84. Then your idea is that cured rubber and vulcanized rubber is the same, is that it?

A. These terms are practically synonymous in a rub- 991
ber factory, and as far as I know the same.

R-X Q. 85. Well that being your understanding will you please give your answer to R-X Q. 81, as to the compressibility of pure rubber, cured or uncured?

A. It is always possible to hold compression in a piece of rubber under certain conditions, rubber being resilient and elastic will compress as well as stretch, and as a rubber tire is applied to a wheel and compression distributed throughout the entire length this is to butt the ends of the joints together and hold same for all time so that the rubber may through all practicable pur- 992
poses be endless when applied to the wheel. This compression being held in place for quite a time the rubber eventually sets, that is, the compression remains in place, although this is not true until after the tire has been on the wheel for some little while. I might illustrate this in the way of a rubber band that has been stretched over a large object for some time allowed to remain in the position in various changes of temperature and then removed. It will be noticed that the band in question never goes back to the original size that it was when used. This illustration of course works in the opposite direction from the compression of the rubber tire, but 993
goes to show that what is I am told an acknowledged fact that rubber and its compounds will cure and set by the action of the air, commonly called air cured.

Answer objected to as not responsive, argumentative and immaterial.

R-X Q. 86. I don't think you have answered the question, but you have gone way beyond the limit of the question. I asked you only as to your idea of one of the characteristics or possible characteristics of rubber, and that is, in your opinion, is rubber, cured or uncured, as you understand it, capable of being compressed, that

994 is, capable of being made to occupy a less space, the rubber becoming denser, like a cork, or sponge. What is your idea as to this?

A. To some extent, yes.

R-X Q. 87. To about what extent, in proportion, would you say, or percentage, taking a sample of this rubber tire as the example?

A. This particular one?

R-X Q. 88. Any of them.

A. For instance, if the circumference of a wheel were to be 9 feet at the channel base or rubber tire seat we would apply a piece of rubber tire 9 feet and
995 6 inches long, the six-inch compression or extra length of rubber being distributed as evenly as possible throughout the circumference of the tire on the wheel.

R-X Q. 89. To what per cent. then, would you say that the rubber was compressible?

A. The same percentage as 6 inches would bear to the 9 feet, between 5 and 6 per cent. This applies to standard rubber tires made of compounded rubber, to be used as rubber tires.

R-X Q. 90. In your opinion would this compounded or cured rubber have a greater or less compressibility
996 than pure or uncompounded rubber?

A. Not being familiar with what pure rubber will do I cannot answer your question. I have never seen any absolutely pure rubber vulcanized or cured.

R-X Q. 91. Well give us your opinion as to the compressibility of cured or uncured rubber as compared with the rubber in the rubber tires on the wheel which you have produced, that is which has in your opinion the greatest percentage of compressibility?

A. Various grades of pure rubber have different specific gravities. To what grade of rubber do you refer?

R-X Q. 92. Take up river fine para for instance and give your opinion as to the percentage of compressibility of this pure rubber, cured or uncured as compared with the rubber in these rubber tires on the wheels which you have produced? 997

A. It is probably possible to compress the pure rubber just as much as vulcanized or cured rubber but it will not spring back into its original place and position the same as the cured rubber will.

R-X Q. 93. Leaving out the question of its springing back again your idea of the compressibility of pure rubber is that it is substantially the same as the rubber in the rubber tires in question, is it? 998

A. No they are both under different conditions. It would be impossible to cut a piece of pure rubber, uncured or unvulcanized, sufficiently large enough for the use as a rubber tire, consequently I do not feel that I could make a comparative test.

Answer objected to as not responsive.

R-X Q. 94. The question has not anything to do as a matter of fact with a rubber tire only with the characteristic of rubber which forms the tire. Now you have testified in your opinion that the rubber forming the tires under discussion is compressible between 5 and 6 per cent., and this of course applies whether a long piece or short piece, the percentage being the same. Now my question is, would, in your opinion, the pure and uncompounded rubber have a greater or a less percentage of compressibility? 999

A. I believe it would have a greater.

R-X Q. 95. Have you any idea what percentage of pure rubber enters into these compounds for rubber tires?

A. I have not.

R-X Q. 96. You spoke of air cured rubber a while

1000 ago. How do you distinguish that from vulcanized rubber?

A. This might be called air vulcanized rubber due to the action of the atmosphere and the atmospheric conditions on compounded rubber that has been cured or vulcanized by artificial heat, generally steam.

R-X Q. 97. My understanding from your testimony, is that there is no such thing as cured pure rubber that has not been vulcanized. Is that right?

A. I believe not in manufacture of rubber goods of commerce.

1001 R-X Q. 98. I did not limit my question to manufactured goods, but to rubber generally. The question being whether there is such a thing as cured pure rubber, unvulcanized?

A. I don't know of any.

R-X Q. 99. Mr. Pond, the defendant's expert in this case testified that rubber was not compressible at all and that if there was any difference compounded rubber would be slightly compressible where pure rubber would be non-compressible. You differ from Mr. Pond in this regard, do you?

1002 A. The statements I have made are what I believed to be facts, but not being a rubber expert, as stated before, I could not prove the statements I have made.

R-X Q. 100. Is not the same true about what actually takes place in the inside of these internal wire tires in use, that is to say, that it is impossible to see what takes place, and your opinions have been given here simply according to your own ideas. Is that right?

A. Ideas based on experience, and conclusions arrived at in my own mind during my term of service with the Diamond Rubber Company.

R-X Q. 101. And from your own ideas of the char-

acteristics of and the operation of the parts which make up the tire. Is that right? 1003

A. I refer you to my former answer.

R-X Q. 102. You mean that your answer to this last question is the same as your answer to R-X Q. 100?

A. For all practical purposes, yes.

R-X Q. 103. Were you familiar with what is known as the Morgan & Wright band tire and International band tire?

A. Yes.

R-X Q. 104. Referring to your re-direct answer to question 76, where you attempt to state what you think are the essential characteristics which makes this tire a success, what if any of these characteristics would not apply to the Morgan & Wright and International tire, assuming the band fastening device be used instead of the wire? 1004

A. Well in the first place, it would more or less stretch the bands which we do not experience with high carbon wires used for retaining the two wire tire. It will also be seen that the hole in the tire through which the band is inserted would have to be wider than double the diameter of the hole in the tire of the two wire type, that is it invariably was so and the tendency to cut out on the part of the band tire was very great, and the per centage that did cut out was very large. The general effect in comparision with comfort as regards the two wire tire and the band tire when in use on the vehicle, I believe there was no difference, no appreciable difference. 1005

R-X Q. 105. Isn't it possible to get a steel band of high carbon steel?

A. I believe it is but I never saw one of as high point carbon as the wire that is now used. There was one concern that undertook to stiffen the bands by rolling

1006 a bead up on each edge of same, with no degree of satisfaction to my mind.

R-X Q. 106. Referring to your answer to R-D. Q. 76 so far as the prosperity of the carriage owner and his desire for greater comfort is concerned, this would apply equally to any rubber tire which is a success, wouldn't it?

A. I believe it would, but always in favor of the tire that would cause the least annoyance and least inconvenience in having to be reset, etc.

R-X Q. 107. That being the case, and assuming that high carbon steel might be used for a band, the only characteristic which you have described in your answer
1007 to R-D. Q. 76 as making this tire a success that would not apply to the Morgan & Wright and the International tire, is the fact that they use the independent retaining wires instead of the bands, is that right?

A. I do not believe that it would be possible to make band tires a success whether or not high or low carbon bands are used, for the fact that there are none in existence that I know of today which tend to show this.

R-X Q. 108. You state as the first characteristic careful application. This might be made to apply to the Morgan & Wright tire, couldn't it?

1008 A. Yes, but with one or two exceptions. With a band tire there would be no need of being careful to see that the retaining wires were drawn evenly and just alike as in the case of the two wire tire.

R-X Q. 109. So that the careful application of Morgan & Wright band would be simpler than where two wires had to be drawn evenly, is that it?

A. I would say so.

R-X Q. 110. The next characteristic that you state in this answer is "the use of what is known as hard or high carbon wire." If for the word wire we were to substitute steel or band, I understand that you have above

stated that this could apply to Morgan & Wright or the International band tire. The next characteristic you mention is "the ability of the rubber tire itself to resist wear." Also of the rubber to resist the strain and pull upon the tight retaining wires. This last characteristic particular to mean the quality of the rubber itself does it not? 1009

A. Yes, I would say so.

R-X Q. 111. And there is no reason why the same quality of rubber might not be put in a tire having the Morgan & Wright or International form of fastening device as in the tire exhibited here, is there not?

A. No reason that I know of. 1010

R-X Q. 112. Did I understand you to say that the endless wires, side wires I believe you called them, in "Defendant's Exhibit Firestone External Side Wire Tire" were sprung into position by forcing them over the side flanges of the retaining channel?

A. Yes.

R-X Q. 113. Did the wires stretch in doing this?

A. I do not believe they did.

R-X Q. 114. The wire band formed by each of these wires is clearly less in diameter than the diameter of the channel measured from outside to outside, is it not? 1011

A. Yes.

R-X Q. 115. There must have been, therefore, some elasticity somewhere to permit that wire to pass over the channel of greater diameter than the wire, was there not?

A. Possibly so. It may have been in the wheel; the clamps and levers are very powerful that are used in forcing this wire over, and, too, it is barely possible that the wire has some spring in it, being of high carbon, but it is possible to make these wires too small in circumference so that they cannot be put on at all. The margin

1012 allowed for springing over the channel wing consequently is very very slight.

R-X Q. 116. As a matter of fact what actually takes place is that the rubber under the wire on that side of the wheel to which the band is first applied is by the pressure exerted by the clamps and levers compressed sufficiently to allow the other side of the band to pass over the flange of the wheel on the opposite side, is that true?

A. I don't know about this. The wires are put on together.

R-X Q. 117. Well what do you mean, together?

1013 A. Well I mean that they are forced on to and over the wing of the channel simaltaneously by the double set of clamps one working each side of the wheel, clamps or levers.

R-X Q. 118. I see you entertain a different idea of the expression "the side of the wheel" than what I intended. By side of the wheel I meant the opposite side of the hub, that is, standing the wheel vertically, the correct expression would be the top and bottom. There being some confusion would you kindly describe just how these side wires are placed into position on the

1014 wheel?

A. The wheel is hung on a spindle, the rubber and wires started at a given point, and the wheel all the time being stationary; by means of a long lever connected to grips or arms the wire is forced up to the top of the channel and over same until ultimately it drops into place. Of course the wire and rubber has been clamped and held in position at the initial starting point.

R-X Q. 119. Then as I understand it, the rubber and the two retaining bands are all together and are forced over the channel together, is that right?

A. The rubber is laid in the channel, there is no

forcing of the rubber, in fact there is practically no compression in a rubber tire of the side wire type. 1015

R-X Q. 120. Then what you really do is to place the rubber in the channel and then hook the two endless bands which are to be the side retaining wires over the flange of the wheel, say at the bottom of the wheel so that each wire rests upon a rubber cushion, formed by the tire and between the wire and the bottom of the channel, then by pressure exerted on these bands they are simaltaneously drawn outwardly from the hub or center of the wheel and at the opposite side or top of the wheel until they will slip over and clamp at that point, and then they are slipped or snaped into position. 1016 Is that right?

A. To all intent and purposes your understanding is correct, but the retaining wire does not rest altogether on a cushion of rubber when it is in place. There are cross wires at intervals running through the tire and it is on the ends of these that the retaining wires rests. These cross wires being vulcanized into the body of the tire itself.

R-X Q. 121. These cross wires however have a cushion of rubber under them, have they not?

A. A slight cushion. 1017

R-X Q. 122. And by taking the screw driver as you did this morning, and slipping it under this tire, both between and at the cross wires, it indicates that the cushion of rubber under the same still has elasticity and ability to yield, does it not?

A. It shows slight ability to yield by the use of a screw driver, but the screw driver is applied at a point and at an advantage that is not encountered when the tire is in use on a vehicle, and I have every reason to believe there is no movement at the point to which we applied the screw driver when the tire is in use.

1018 All that part of the answer beginning with the word "but" being objected to as not responsive, volunteered and argumentative and incompetent.

R-X Q. 123. The application of the screw driver to "Defendant's Exhibit a Standard Rubber Tired Wheel," in the same way, shows that the elasticity of the rubber under the wire and its ability to yield is even greater than on the Firestone Side Wire Tire, because of the greater thickness of rubber, due to the absence of cross wires. Is that not true?

A. Possibly so.

R-X Q. 124. This high carbon wire which you say
1019 is used in both of these exhibits, being non-stretchable when you raise the wire up by the means of a screw-driver or any other means away from the base of the channel, what do you understand permits it to move if the wire cannot stretch?

A. I don't know.

R-X Q. 125. You do know, do you not, that if the rubber under the wires was soft enough, you could by your fingers or by any slight means, pull them (the wire) out from the base of the channel by compressing the rubber which is under the wires on the opposite side of the wheel from where the wires are raised, by opposite side meaning across the wheel?

A. Not with the fingers if the tire was properly ap-
1020 plied.

R-X Q. 126. My question had nothing to do with the proper application of the tire, but it simply assumes that this cushion of rubber under the wires and extending entirely around the wheel and between the wires and the base of the channel is quite soft and elastic, would it not be possible, then, to raise these wires away from the channel on the other side without stretching the wires or causing the wires to be drawn into the rubber which

lies under the wires on the side, or that portion of the wheel which is opposite to the point where the power is applied to raise the wire? 1021

A. Not with the hands, if the wire is drawn tight and the rubber beneath the wire and between the bottom of the wire and the base of the channel is compressed to its utmost capacity.

Answer is objected to as not responsive.

R-X Q. 127. The question as you put to yourself is obvious, and your answer may be correct, but it is not the question I put to you, but it is substantially the contrary. First, I want you to assume that the rubber lying between the wire and the channel is not compressed to its utmost capacity; that it is soft and elastic and has a large degree or compressibility or ability to yield left in it. The question is, in such case could you not raise the wires from the channel at one side of the wheel by causing them to embed themselves more deeply in the rubber on the opposite side? 1022

A. You probably could, but I still modify my answer by saying that a tire applied with the wires as described would not, in my estimation, be properly applied, because the rubber at the base of the wires was not compressed sufficiently by the wires; in other words, the retaining wires would be too loose. 1023

All that part of the answer beginning with "but," down to the close, objected to as not being responsive, volunteered and argumentative, and motion is made to strike it out on the ground of incompetency and immateriality.

R-X Q. 128. So, then, as a matter of fact, the ability or capacity of these wires to be raised or moved away from the channel, and the power required to move them, depends largely on the elasticity of the rubber cushion lying between the wire and the channel, and as to whether

1024 or not the elastic limit of this rubber has been reached in tightening the wire; is that not true?

A. Yes, provided you have a wire that will not stretch.

R-X Q. 129. Do you know how many different concerns besides your own are using what you call a high carbon wire?

A. I believe all of them except the Consolidated Rubber Tire Company, the complainant in this case. I have never known of this company using a high carbon steel wire, but have not been in a position to investigate this question personally for some little time.

1025 R-X Q. 130. You, in your direct examination stated that the channels which you use are standard channels which could be secured now from different rolling mills. Is it the practice of different assemblers of these tires to buy different makes of rubber and apply them in the same standard channels which they can secure in the market?

A. I believe it is. We never solicited channel business on account of the small margin of profit. When selling tires or soliciting business the channel was never mentioned. That is, when figuring with large carriage makers. Smaller repair men we often accommodated with channels from the small stock we carried for this purpose, purchased from various steel mills; the last we had 1026 was called standard Carnegie channel, made by the Carnegie Steel Company, of Youngstown.

R-X Q. 131. How about the wires; do you furnish those, or do you allow your customers to buy them from the mill?

A. In most instances, especially with large customers, the wire is purchased direct from the company manufacturing the same on our recommendation as regards features of its hardness and high carbon qualities.

R-X Q. 132. Your company, the Diamond Rubber Company, at Akron, is essentially a rubber company, and

so far as practicable, in the sale of these tires to carriage men and other large dealers, you confine yourselves, as far as possible, to the sale of rubber, do you not? 1027

A. Yes, sir, that is right.

CHAS. H. SMITH.

Thereupon defendant called MR. LEROY EIGHME, in defendant's behalf, who, being first duly sworn, testified as follows, in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation. 1028

A. Leroy Eighme; 54; Chicago; liveryman.

Q. 2. How long have you been in the livery business in Chicago?

A. Seventeen years.

Q. 3. How extensive, how large is your livery business during that time?

A. I had the carriage service at the depots at one time.

Q. 4. Give the years.

A. I had it eight years. I have been out of there five years now.

Q. 5. How many rigs did you run, say, for the last ten or twelve years? 1029

A. Thirty-six cabs, six carriages, and a number of victorias.

Q. 6. Have you used during that time a rubber tire like that shown in the Grant patent in suit?

A. Yes, sir.

Q. 7. About how long have you used that tire on your rigs?

A. I got my tires on about as soon as they came out here in Chicago.

1030 Q. 8. Who did you get them of?

A. Firestone. It was the Kelly tire, but I got it of Firestone.

Q. 9. How long did you use this Kelly tire as shown in this patent?

A. About three or four years, I guess.

Q. 10. What tire have you used since?

A. I have used them all; every tire in the market.

Q. 11. Do you put these tires on your wheels yourself?

A. No, sir, but I take the old ones off.

1031 Q. 12. Who does put on the tires on the wheels of your carriages and cabs, etc.?

A. The firms that I buy them of.

Q. 13. Mr. Eighme, how many tires have you had put on or have you taken off of your wheels for the last seven or eight years; I don't ask for the exact number, but your best estimation?

A. Thousands, I guess.

Q. 14. Why do you take off these tires from your wheels?

A. I sell the old rubber.

Q. 15. But what is the matter with the tires that you

1032 take them off of your wheels?

A. They are worn, the wires have cut through the rubber.

Q. 16. Does the cutting of the wires through the rubber destroy the tires before they are worn out?

A. Yes, sir.

Q. 17. How many, or about how many, as to percentage of the tires that you have taken off of your wheels are worn out down to the flange before they cut out?

A. About one-third of them.

Q. 18. Whereabouts on these tires does the wires cut out, on the side or on the bottom of the tires?

Objected to as leading and suggestive. 1033

A. On the bottom.

Q. 19. Did you bring down with you some samples of your tires that you have taken off of your wheels by this cutting of the wire through the tires before they were worn out?

A. Yes, sir.

Q. 20. I call your attention to three tires, or parts of tires, old tires, on the floor before you, and ask where these tires came from; who brought them here?

A. I brought them here. Off my wheels.

Q. 21. How much to you get a pound for these old tires that you take off? 1034

A. Six or seven cents a pound.

Q. 22. Mr. Eighme, in taking off these thousands of tires that you have from your wheels during the last seven or eight years, have you found any considerable portion of them rusted or naturally cemented to the rims at their base, so that the base of the tire and the iron of the rim at the bottom was rusted or fastened together?

A. Yes, sir, a great many of them are rusted or cemented to the channel of the rim.

Q. 23. How much force does it require, and in what way do you tear or separate these rusted tires from the rim? 1035

A. Sometimes when we pull them off they stick so hard to the channel that you pull the canvas off from the bottom.

Q. 24. Do you do that with your one hand, or your both hands?

A. One hand sometimes, and sometimes two, when they stick fast.

Q. 25. Examine these three tires that you have brought here, and now before you, that you took off your wheels, and state whether these tires were rusted or naturally

1036 cemented on the wheel rim from which they were taken and had to be pulled apart by hand, as you have described.

A. This one here you see has been cemented. That one there has a cut in the bottom and is caused by the wire being too loose, the long one. This one here, the short one, was cemented to the rim. This buggy tire, this small one, that has been rusted or cemented to the rim.

Defendant's counsel here offers in evidence the three tires identified by the witness, and requests that they may be marked "Defendant's Exhibit
1037 Eighme's Three Destroyed Usual Samples Cement Rusted Tires."

Complainants' counsel objects to the offer, especially the title, as being misleading and otherwise incompetent.

Q. 26. Mr. Eighme, upon those tires that were locked in position by the two wires on your various vehicles so that they couldn't creep, did you ever know or hear of those tires rising or falling by any strain that was put on the wheel and by the wires rising and falling in any kind of hard usage of your vehicles?

1038 Question objected to as incompetent and calling for secondary and conclusions, and also as immaterial.

A. No, sir.

Cross-Examination by Mr. Staley.

X-Q. 27. Please look at these different samples and tell what kind or make of tires they are.

A. I could not tell; I do not keep track of them, but I think they are Firestone.

X-Q. 28. When were these particular tires applied to the wheels, and when were they taken off by you?

A. I couldn't answer that question. I took them off, 1039
though, myself. I took that tire there (pointing) off about a month ago.

X-Q. 29. And the other two you don't know when you took them off?

A. No, I don't keep track of that. I don't know.

X-Q. 30. Then, do you remember that of these particular tires one was cut by the wire being too loose, and another was rusted to the channel, or did you tell that from examining the condition of the tire here?

A. I can tell by examining, and I remember of pulling them off.

X-Q. 31. What particular vehicle was this short piece 1040
of tire on that you say was cemented or rusted to the wheel?

A. One of my cabs.

X-Q. 32. Which one, and was it a hind wheel or front wheel?

A. Hind wheel.

X-Q. 33. Which cab?

A. I haven't them marked, and I can't tell which one.

X-Q. 34. Have you not some way of identifying your particular cabs?

A. Yes. Parties ask me for which cab they want, 1041
and I tell them.

X-Q. 35. Well, which particular cab did this particular tire come off of?

A. Couldn't tell you.

X-Q. 36. What particular part or feature of this short piece of tire indicates to you that it was rusted or cemented to the rim?

A. The rust on the bottom of the tire.

X-Q. 37. I notice that this particular sample has two streaks of what would appear to be a hard, shiney place, as though the tire had been rubbed. Would that not in-

1042 dicate that there had been some rubbing action of the tire?

A. It would indicate that there is where the two wires went through and held to the wheel and rusted to the channel.

X-Q. 38. Then, it is your idea that these smooth, shiney streaks on the bottom of the rubber are caused by the rubber adhering or rusting to the bottom of the channel, is it?

Objected to as not a correct designation of the channel portion of the old tire.

A. Not the smooth streaks. The pulled off streaks.
1043 Each side where it is rough is where it rusted to the channel. It isn't smooth, it's rough.

X-Q. 39. Well, you see the smooth shiney streaks that I refer to, do you not?

A. There is a shiney streak in the center; there is no shiney streak on the sides at all.

X-Q. 40. Please look across this tire towards the light and see if you do not see a dull streak in the center and on each side of two bright or shiney streaks, and on the outside of those two rough or sort of rust colored streaks.

A. I see two rough streaks. You hold it up to the
1044 light and of course it is bright. It is where it has been cemented to the wheel.

X-Q. 41. Then, it is your idea, is it that the bright streaks are what indicated that it was cemented to the wheels; is that right?

A. The broken parts of the bright streaks show where it is cemented to the wheel.

X-Q. 42. Did you notice that in this particular sample of tire, that what you call the rough or broken places are at the extreme edge on the bottom of the rubber, and these do not show bright when held to the light, but there

are two distinct bright streaks on the inside of each of those rough streaks? 1045

A. Yes, I see it.

X-Q. 43. And these bright streaks are directly under where the wires went through the tire, are they not?

A. Yes.

X-Q. 44. Would that not indicate to you that there had been at some time some rubbing action between that tire and the channel immediately under the wire?

A. No.

X-Q. 45. Your idea is that that was made bright by the rusting of the rubber to the rim immediately under the wires; is that right? 1046

A. My idea is that the wires held that rubber so close and tight to the channel that it caused that.

LEROY EIGHME.

Adjourned to 10 o'clock A. M., January 7, 1908.

Chicago, Illinois, January 7, 1908. Met pursuant to adjournment. Present, same as before.

Thereupon defendant called as a witness, in defendant's behalf, MR. HARVEY EDGERTON, who, being first duly sworn, testified as follows, in answer to interrogatories propounded by Mr. Offield: 1047

Q. 1. Please state your name, age, residence and occupation.

A. Harvey Edgerton; 75 years; occupation, liveryman; residence, where I live is 6357 Jackson avenue.

Q. 2. How long have you been in the livery business in this city?

A. Thirty-five years, since March, '73.

Q. 3. Where are you now located in this city, and how long have you been at this same place, in the livery business?

A. 37 East 14th street; thirty-five years.

1048 Q. 4. On an average, how many rigs of different descriptions do you own and employ in your livery business?

A. Well, I should judge about thirty.

Q. 5. What kind of rigs?

A. Well, all kinds, cabs, coupes, carriages, victorias and buggies.

Q. 6. Do you use solid rubber tires upon these different rigs, and for how long a time?

A. Well, ever since they came into use Chicago, I do not know how many years ago that is.

Q. 7. What is your best recollection?

1049 A. Why, I should judge that is probably about fifteen years ago.

Q. 8. Are you familiar with the rubber tire shown in the drawings of the patent in suit, known as the Kelley or Grant tire, of which I now show you a picture of?

A. That's the kind we most always use.

Q. 9. How long did you use this tire of the patent, or like the patent, in suit, and from whom did you purchase the tire?

A. Well, I don't know, probably ten years; from this agency, right on Wabash avenue, the Consolidated Rub-

1050 ber Tire Company. It wasn't Consolidated Rubber Tire Company when it first started.

Q. 10. The Rubber Tire Wheel Company?

A. It was the Rubber Tire Wheel Company.

Q. 11. Did you put these rubber tires on yourself?

A. No, sir.

Q. 12. Who did put them on?

A. The company.

Q. 13. Did they come and get the wheels to put the tires on your rigs, or did you take the wheels to the company?

A. Usually they were called for and returned.

Q. 14. Do you know how they were put on the wheels, the tires, by the company? 1051

A. No, sir.

Q. 15. What happened to these solid rubber tires on your cabs after they were put on; I mean were they worn out, lost or destroyed in use?

A. All three is an answer to that question.

Q. 16. Well, what proportion of these tires were worn out by use on your rigs, and what proportion destroyed without being worn out; state approximately?

Question objected to as calling for opinions and conclusions of the witness.

A. About one-half were worn out; one-half rendered useless by ripping out from the wire. 1052

Q. 17. How did these tires rip out from the wire; I mean, on the sides or bottom, or both?

Objected to as leading.

A. On the bottom.

Q. 18. Did you have anything to do personally with the taking of these tires from the wheels, either after they were worn out or ripped or torn out from the wires?

A. Yes.

Q. 19. What did you do with these tires, Mr. Edgerton, that you took off of your vehicles from these different wheels? 1053

A. Sold them.

Q. 20. About how much did you get a pound for them?

A. Six and seven cents.

Q. 21. State what has been your experience in taking these tires from the wheels, as to the condition of the tire in being rusted or naturally cemented to the rim by rust or corrosion.

A. The canvas usually sticks to the rim of the vehicle, the iron, the channel.

1054 Q. 22. How much force ordinarily would you have to exert to separate the base of the tire or canvas from the channel as rusted in?

A. Ordinary strength.

Q. 23. With your hands?

A. Yes.

Q. 24. Mr. Edgerton, during the years that you have used these solid rubber tires, when these tires were rightly and tightly wired into and on the base of the channel, did you ever know or hear of these tires rising or falling or the wires moving up and down in the channel by any of the severe strain of travel and use in the city?

1055 Question objected to as calling for hearsay, and also for conclusions of the witness upon the matter of which he is not shown to have any special knowledge, and also as immaterial.

A. I never heard of it.

Q. 25. As an old liveryman, what have you to say as to the severity of the cab service upon rubber tires, or carriage service in this city, as compared with such use elsewhere?

A. I don't know what the conditions are in other cities. Our streets are very severe on rubber tires, more

1056 especially where there are car tracks.

Q. 26. Do you now use on your rigs these internal wire rubber tires like the patent I showed you?

A. No, sir.

Q. 27. How long have you quit using such tires?

A. Some five or six years, I think.

Q. 28. What kind of a solid rubber tire, as to fastening, did you substitute in the place of this two internal wire tire?

A. The side wire.

Q. 28*a*. Please look at the wheel in evidence in this case, marked "Defendant's Exhibit Firestone External

Side Wire Tire," and state if this is a specimen of the wheel as to tire application, that you have used in the last five years upon your rigs, or since you abandoned the tire of the patent in suit? 1057

A. That is the kind that we are using.

Cross-Examination by Mr. Staley.

X-Q. 29. You were here yesterday afternoon to testify, were you not?

A. Yes.

X-Q. 30. Why didn't you testify yesterday afternoon?

A. There was a witness on the stand that consumed the time. 1058

X-Q. 31. Well, that witness finished at 3 o'clock. Were you informed that you were not needed after that?

A. I was informed while the witness was on the stand that I would not be needed that afternoon.

X-Q. 32. Was that after he had finished his testimony?

A. While he was on the stand.

X-Q. 33. Who told you that?

A. The young man who requested me to come down here to testify in this suit. 1059

X-Q. 34. And what's his name?

A. I don't remember it. I believe it was Mr. Harmer, of the Diamond Rubber Company.

X-Q. 35. About what time did he tell you this?

A. About 2:45 P. M.

X-Q. 36. That was during the time that complainants' counsel, that is, myself, was cross-examining the witness, was it?

A. I think so.

X-Q. 37. What different makes of the internal two-wire tires did you use in your business?

1060 A. I don't recall any other but the first tire that was introduced here in the city. That kind.

X-Q. 38. Had you had any experience with any kind of rubber tires prior to that time?

A. No, sir.

X-Q. 39. And you continued to use what was known as the Kelley tire, or Springfield tire, exclusively up to the time that you began using the Firestone side-wire tire?

A. Yes.

X-Q. 40. When you testified as to these two internal wires being cemented or corroded to the rim, you do so
1061 from your memory four or five years back, do you?

A. Yes, sir.

X-Q. 41. I suppose in buying these tires you were interested in getting what you thought was the best tire for the least money, were you not?

A. Yes, sir.

X-Q. 42. And I suppose you never paid very much attention, if any, to any theories on which the tires worked, did you, so long as it was satisfactory to you?

A. I studied the application of the two different styles and came to the conclusion that the side wire would stand
1062 the test better than the internal. And for that reason gave my business to the Firestone Company.

X-Q. 43. But my question referred to these internal wire tires, whether or not you had ever given any special attention to the theory on which the tire was supposed to operate?

A. Every agent for the different kinds of tires had a theory upon which he worked, and in that way I became more or less familiar with the different appliances for rubber tires. Was not satisfied with the internal wire, and always ready to adopt any new method for applying the same.

X-Q. 44. Well, just go on and explain some of the different theories of the different agents that were explained to you, about the internal wire tires, particularly. 1063

A. The principal reason was that there was not rubber enough left on the bottom to keep that tire on any length of time.

X-Q. 45. Was that a theory that was explained to you by the agent for the sale of the internal wire tire?

A. No, sir. That was my experience. This will explain what I mean, the tearing up of the part of the tire that rests upon the pavement, referring to "Defendant's Exhibit Dished and Naturally Cemented Rubber Tire Wheel." 1064

Answer objected to as not responsive.

X-Q. 46. I don't think you understood the question. You stated in a previous answer that every agent for the different kinds of tires had a theory as to how his tire worked. Now, I wanted you to state what the theory or theories were explained to you by the agent for the internal two-wire tire, as to its operation or working. Just explain what was told to you by the agent as to that theory.

A. That is a hard question to answer. They all had their theories and their reasons for saying that theirs was the best tire on the market. I have forgotten what those particular reasons were. Generally in the application of the tire to the wheel. My reason for adopting the side wire did not come from solicitation of any agent, but from my experience with the internal wire. 1065

That part of the answer beginning with "My reason" down to the close of the answer, objected to as not responsive and volunteered.

X-Q. 47. Did you personally take off all of the tires, I mean the internal two-wire tires, from the wheels which you used during the period mentioned by you?

A. No, sir.

1066 X-Q. 48. What proportion of them did you personally take off?

A. A very small proportion. The wheels were generally sent to the shop to be prepared.

X-Q. 49. And the old tires were taken off there, were they?

A. Mostly, and kept by the company until I found out that they were valuable and worth something to us, then I commenced taking them off in the stable, or having it done, in order to save that amount.

X-Q. 50. And after you had them taken off at your stable, you personally did not take off very many of them,
1067 but had it done by others; is that right?

A. I saw it done, mostly.

X-Q. 51. Did you ever personally take off any where you did all the work yourself?

A. I don't remember that I ever did. I have assisted in taking them off several times, and am doing it almost every day at the present time.

X-Q. 52. But what you are taking off now are the side wires, are they not?

A. Mostly, yes. I often buy carriages with the internal wire on, but when I replace them with new I put
1068 on the side wire.

X-Q. 53. So that you are still using, then, some internal two-wire tires?

A. On some carriages that I have bought second-handed from private families.

X-Q. 54. Do you know what particular makes they are?

A. You mean the internal wire?

X-Q. 55. Yes.

A. Mostly the Goodyear tire.

X-Q. 56. Any Diamond internal two-wire?

A. Not that I know of. I never have used the Dia- 1069
mond tire that I know of.

X-Q. 57. I suppose, as a matter of fact, after the tire has been used a short time and the name obliterated, that it would be pretty hard to tell whether it was a Diamond, Kelley, Goodyear, or other make of rubber tire, wouldn't it?

A. For me it would. Every factory could tell you what tire it was.

HARVEY EDGERTON.

Thereupon defendant called, in defendant's behalf, MR. 1070
FRED M. MECKEL, who, being first duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Fred M. Meckel; 39 years; 7150 Normal avenue, Chicago; wagon manufacturer.

Q. 2. How long have you been engaged in the business of carriage building in Chicago?

A. I have been in business about twenty-five years. That is, from the time I started into business.

Q. 3. Say, for ten years past, how extensively have 1071
you been engaged?

A. In the size of my business, number of employees?

Q. 4. Yes.

A. Approximately seventy-five employees.

Q. 5. During the last ten years has it been any part of your business to use or apply solid rubber tires like the tires of the patent in suit now shown you?

A. Yes, sir.

Q. 6. Approximately how many of such tires have you taken off or put on in your business upon various wheels during the last ten years?

1072 A. Oh, I should judge from 400 to 500 sets.

Q. 7. What was the name of the first two internal wire rubber tire that you used?

A. The first tires that I recall having used were made by the Rubber Tire Wheel Company, afterwards the Consolidated Rubber Tire Wheel Company.

Q. 8. During any portion of the last ten years have you personally in your plant applied these solid rubber tires to your wheels?

A. Yes.

Q. 9. By hand alone, or by a machine?

A. By a Morgan & Wright machine.

1073 Q. 10. How tight do you stretch these wires on the tire or wheel when you put them on with this machine?

A. Why, we draw them tight, so the rubber will set close to the channel, and the wires are tightly drawn.

Q. 11. Approximately how near the breaking strain of the wire, do you know?

A. No, I don't know how near the breaking strain. Just enough so that they will not cut the rubber.

Q. 12. Do these wires, or does this tire remain in the position as first clamped on the wheel by the machine until it is worn out, or what happens to the tire in the

1074 continued rough usage of the wheels in this city?

Objected to in part as incompetent, and as asking for conclusions.

A. If the tire is properly set, or if the wires are properly drawn, I should say it would hold its original position. My experience has been that as the tire receives wear that it tears at the side of the wire or the perforations for the wires becomes rusted and adheres in the channel.

Q. 13. What proportion of the solid rubber tires that you have become familiar with in your business for ten years past become rusted and adhered to the channel?

A. Well, I should say a large majority of them. 1075

Q. 14. When you take these tires from their channel rims, when they are either worn out or destroyed, how much force is necessary, or approximately, to separate or tear these adhering tires upon their contact portion from the channel bottom?

A. I don't know exactly how much force it requires, but it very often leaves the canvas, sometimes the lower body of the tire adhering to the channel.

Q. 15. What I desired to ask was, whether the tires were torn from the channel by a machine or by simply a hand pull?

A. Well, my experience has been by the hand pull. 1076

Q. 16. From your experience please state about what proportion of the tires that have been used by you during the last ten years have worn down to the channel by use, and what proportion has cut through the wires and been destroyed before being worn out upon their tread or contact surface?

Question is objected to as incompetent and calling for secondary evidence. A carriage builder in the nature of things, not being able to tell what becomes of all the tires he sells on vehicles, and further objected to as immaterial, as a tire may clearly be 1077 worn out without being worn down to the channel.

A. Well, there are very few that are worn to the channel. The majority are worn, and as the rubber becomes less lifeless they tear at the wires.

Q. 17. Mr. Meckel, during the ten years that you have used and been familiar with the solid rubber tires with two internal retaining clamping wires, as you have described, have you ever yourself known, or have you ever heard it claimed by anybody, that these tires and wires rose and fell and reseated themselves in the actual strain put upon them, and by the most severe strain put

1078 upon them in the rough usage among the car tracks of this city?

Objected to as incompetent, also as immaterial.

A. Not where the wires have been properly drawn tight.

Q. 18. Have you ever abandoned the use of these internal two wires in placing tires upon your different styles of rigs and used any other style of wire fastening device, to any extent, and if so, what?

A. Why, we have never abandoned the two internal wire tire. We use both the internal and external wires.

1079 Q. 19. Please examine "Defendant's Exhibit Firestone External Side Wire Tire," and state if this is the side-wire tire you refer to, and as being used by you in part, instead of the two internal wire tire.

A. Yes.

Q. 20. How many years have you been using this side-wire tire device before you?

A. About four or five years.

Cross-Examination by Mr. Staley.

X-Q. 21. About how many vehicles do you turn out in a year?

1080 A. Oh, I should judge about 500.

X-Q. 22. What kind of vehicles, principally?

A. Parcel wagons, business buggies, and trucks.

X-Q. 23. By parcel wagons, do you mean delivery wagons?

A. Yes.

X-Q. 24. You don't build cabs, broughams, victorias, and that class of vehicles?

A. No.

X-Q. 25. Do you use rubber tires on all the vehicles you build?

A. No.

X-Q. 26. About what per cent. of the vehicles you build are not equipped with rubber tires? 1081

A. Seventy-five per cent.

X-Q. 27. What different makes of the internal wire tire have you used in the last ten years?

A. I have used Rubber Tire Wheel Company, Consolidated, Morgan & Wright, Calumet, India Rubber Tire Company, Firestone, Diamond Rubber Company; that's about all I can recall.

X-Q. 28. Did you ever use any Morgan & Wright band tires?

A. Yes, sir.

X-Q. 29. They have gone out of use entirely, have they not, as far as you know? 1082

A. I have not used any for a great many years. As far as I know, they have gone out of use.

X-Q. 30. Is there any particular difference that you know between the different makes of the internal wire tire; I do not mean difference in the rubber, but I mean difference in the construction and in the mode of operation?

A. No, outside of possibly the shape of the rubber.

X-Q. 31. I suppose that there is sometimes a difference in the quality of the rubber used, is there? 1083

A. Yes.

X-Q. 32. Some tires are cheaper than others on account of the difference in the quality of the rubber, are they not?

A. Yes, sir.

X-Q. 33. Is it not true that while some qualities of rubber might not wear off as quickly as others, that the tire would nevertheless wear out on the outside by the deterioration of the rubber in use, causing it to break out or break away at the top?

A. Why, I presume that's true.

1084 X-Q. 34. Have you noticed in your experience that while the tires do not necessarily wear down to the channel that they do nevertheless wear out by deterioration and that such a tire might actually run longer and be of better service than one which wore down to the channel?

A. Well, I have never seen them wear down to the channel.

X-Q. 35. Never have seen them?

A. No, I never have.

X-Q. 36. How many tires have you personally and with your own hands taken off after they are worn out?

1085 A. I haven't taken any off late years, but I have taken off a great many during the time I was working at the trade myself.

X-Q. 37. How long ago?

A. Well, up until ten years ago.

X-Q. 38. What is the style of your firm, if there is a firm?

A. Individual concern, Fred L. Meckel.

X-Q. 39. I notice you stated that you used a Morgan & Wright machine for applying the two-wire tires. I suppose you could apply any of the standard makes of

1086 the internal two-wire tires with the same machine?

A. Yes, sir.

X-Q. 40. In buying your materials, do you buy a standard channel, which is suitable for any of the different makes of rubber of the internal wire type?

A. Yes, sir.

X-Q. 41. And from whom do you buy this channel?

A. Well, at the present time I am not buying any of it. Well, its four or five years since we put on our own tires.

X-Q. 42. You mean you have the tires put on for you now?

A. We are having our tires applied. 1087

X-Q. 43. Did you understand what was meant by the question that was asked you whether or not you had ever known or had ever heard that these internal wire tires could rise and fall in the channel in operation?

A. Yes, I think so.

X-Q. 44. What was your understanding of that question?

A. Why, that the base of the tire would raise from the channel or kink up.

X-Q. 45. Under what conditions did you understand that was meant to apply?

1088

A. Why, wear, I suppose, or severe usage.

X-Q. 46. Did you understand the question to mean whether or not this tire might yield away from the channel by a side thrust, so that it would raise slightly from the channel, like this does when I put this screw-driver under it?

Defendant's counsel objects to this question as not cross-examination as to any subject-matter inquired of, and that there is no condition of travel of one of these tired vehicles that represents the operation of complainants' counsel before the witness of forcing a screw-driver or a cold-chisel under a cut away rim 1089 of the tire and prying the wire up vertically by the leverage thus obtained, and that this movement is an attempt to confuse the witness into an admission that an impossible movement of this tire in travel by this kind of leverage could ever actually occur in any side pressure that would be given on the exposed body portion of the tire in actual travel, even on a new tire, and especially and certainly when the tire was under the compression of a load in actual travel.

Complainants' counsel suggests to defendant's counsel that he reserve his arguments until the hear-

1090 ing. His attempted instruction to the witness is also objected to.

The witness is referred to "Defendant's Exhibit Standard Rubber Tired Wheel."

A. Yes.

X-Q. 47. When I put the screw-driver under this exhibit referred to and raise it, can you see the wire move?

Defendant's counsel objects to this illustration and movement by this leverage under the removed portion of the rim of the tire, upon the ground that the wheel itself in any condition of travel is impossible of being subjected to any such leverage or move-
1091 ment, and that under a sufficient leverage of this kind you can pry up Washington's monument.

The objection is objected to as before.

A. I did.

X-Q. 48. Do you know what permitted that wire to move when it was forced up?

A. I think so.

X-Q. 49. What was it, do you think?

A. Why, the elasticity of the rubber. The drawing of the wire against the rubber with a pry from underneath would allow the wire to move at the point of the
1092 pry, I should say.

X-Q. 50. In other words, it's the elasticity of the rubber which lies between the wire and the channel against which the wire is drawn at one side of the wheel when the wire is drawn away at the other side; is that right?

A. Yes.

X-Q. 51. Do you, or did you when you put on rubber tires, use what is called a high carbon steel wire?

A. Well, I should judge the wire that we used was about a thirty to forty carbon, hardly called a high carbon.

X-Q. 52. How did you join the ends of the wires after they were drawn up? 1093

A. Tapered the ends and brazed.

X-Q. 53. How did you test your tires to see if they were tight enough after putting them on?

A. Well, we generally put a test on similar to what you put on there.

FRED L. MECKEL.

Complainants' counsel requests permission to cut off and take away about eight inches from the short length of "Defendant's Exhibit Eighme's Three Destroyed Usual Samples Cement Rusted Tires," leaving the tire in length now 4 feet 6 inches. Defendant's counsel so consents. Complainants' counsel also requests that the piece cut off be marked for identification "Piece of One of Eighme's Samples of Destroyed Tires." 1094

Adjournment taken until 10 A. M., January 8, 1908.

Chicago, Illinois, January 8, 1908. Met pursuant to agreement. Present, same as before.

Thereupon defendant called as a witness, in defendant's behalf, MR. ALBERT BUBSER, who, being first duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield: 1095

Q. 1. Please state your name, age, residence and occupation.

A. Albert Bubser; 50 years of age; 874 West 22nd street, Chicago; foreman of the Owen H. Fay Livery Company repair shop.

Q. 2. What kind of rigs does this company employ in their livery business, and about how many?

A. Automobiles, electric landaus, broughams, victo-

1096 rias; I should judge they have about thirty-five broughams, seventeen landaus, and I think about seventeen victorias, but I am not exactly positive how many of these; electric rigs, they have about seven, and they have eleven hansom cabs, and they have a miscellaneous assortment of other rigs. They have an assortment of old rigs that they use for funeral services. The electric rigs include the automobiles.

Q. 3. How does the business of O. H Fay Livery Company and the number of rigs employed and owned compare with the largest liveryman in this city in this same business?

1097 A. I should judge it ranks about first.

Q. 4. How long have you been with this company?

A. Thirteen years.

Q. 5. How long have you been foreman of the repair shops of this company?

A. Well, let me see—well, I can safely say four years, but I have had charge of it longer than that, but I have not received any extra compensation for it, though.

Q. 6. Please look at the tire shown in the drawing of the Grant patent in suit, and state whether you are familiar with that tire and its operation and use upon

1098 wheeled vehicles.

A. Perfectly familiar to me.

Q. 7. When did you personally become familiar with the application of this tire and its use to and upon the wheels of the different vehicles of your company?

A. To the best of my recollection, from four years ago up to date. It might be longer than that.

Q. 8. Since four years ago or over, how many of these internal two-wire tires like the tires of the patent have you personally applied or personally attended to applying to the different wheeled vehicles of Owen H. Fay

Livery Company; I don't ask for exact number of tires, but your best recollection? 1099

A. I should judge at least 200.

Q. 9. How do you apply these tires to the wheels?

A. In the first place, the rubber is cut the proper length; then the wire is inserted through the holes in the rubber, one end of it placed in the machine in the proper position, the end is filed off or beveled off, the wheel is then placed in the machine, and the rubber drawn around it and the other end of the wire placed in the machine, then they apply what they call a slippery paste to the channel, then the rubber is drawn up to place as tight as it can be drawn around the channel; it is cut off and 1100 brazed to the other end of the wire and the wheel is then taken out of the machine and the space between the two ends of rubber is pounded or drawn together by the machine. I would like to explain how this is done. There is a little attachment on the machine that the rubber is forced under or rolled under; there are two little wheels that the rubber runs under, which are clamped down tight onto the rubber; then the wheel is pulled back under these two little wheels and that forces the rubber ahead, so that it comes in contact with the other end of the rubber. Another way of closing them up is to take a club and hit 1101 the rubber and drive it down to the other end of the rubber, so that the two ends come in contact with each other and close it up that way.

Q. 10. How tight with this machine do you stretch or pull the wires to lock the tire in place in the channel?

A. As tight as I possibly can draw the wires without breaking them.

Q. 11. After you have placed these tires upon the wheels of the company as you have stated, what happens to the tires in actual use; I mean, are they worn com-

1102 pletely out, or destroyed before wearing out; state the facts?

Objected to as leading, also as incompetent and calling for conclusions.

A. Very seldom they are worn completely out. They are generally destroyed by the wires cutting through the rubber and allowing the tire to come off and leave the wires on the channel.

Q. 12. Where do the tires cut through from the wires, either on the bottom or the sides of the tires?

Last objection repeated.

A. Right directly underneath the wires.

1103 Q. 13. In applying these wires or locking the tire in place with the wires by your machine, do you stretch both wires equally as tight as you possibly can without breaking them?

A. As near as they possibly can be stretched.

Q. 14. Mr. Bubser, after you have placed these tires in the rim, and fastened them by stretching the two internal wires as tightly as you can without breaking them, do you yourself know, or have you ever heard of such tires and the two internal wires tilting or lifting in any way from the channel bed in the travel and strain of the

1104 tire, no matter how great to which it is subjected, upon the wheels, on the car tracks or in the streets of this city?

Objected to as immaterial, also as incompetent.

A. Well, I will answer that, no.

Q. 15. Does your employer, O. H. Fay Livery Company, use any other two-wired solid rubber tire except the two internal wires that you have described?

Objected to as irrelevant and immaterial.

A. They do.

Q. 16. What is that tire called?

A. It is called the outside wire.

Q. 17. Please look at the tired wheel now shown you

and marked "Defendant's Exhibit Firestone External Side Wire Tire," and state if that is the tire referred to in your last answer. 1105

A. It is the same tire, but not the same make.

Q. 18. Well, is it the same means of fastening by the two external wires?

A. Same construction. Put on the same way.

Q. 19. State whether or not your company has practically abandoned the use of the two internal wire tires as you have described.

Objected to as irrelevant and immaterial, also as leading.

A. They have, with the exception of the three-quarter inch and inch tires. 1106

Q. 20. And what do they use in their place?

Same objection.

A. Side wire.

Q. 21. And for how long?

Last objection repeated.

A. Well, probably two years. It is more than two years I know, but I don't know how much.

Q. 22. What do you do, or what does O. H. Fay Livery Company do, with the tires, the rubber part, that you take off of the wheels as destroyed as you have described? 1107

A. Sell it to the junk man.

Q. 23. For about how much?

A. Well, the market price fluctuates. Want to know the price of it?

Q. 24. Yes.

A. Well, at present I could get about 7 cents a pound by the ton. Before the panic they were paying 8 and 9 cents a pound by the ton.

Q. 25. Mr. Bubser, in taking off these old tires with the two internal wires from the wheels, in what condi-

1108 tion do you frequently find these tires as to their base portion upon the bottom of the channel iron rim, where the tires have been stretched as tightly by the clamping wires as you have described?

A. Most always find the wire cut through the rubber.

Q. 26. What I desired more particularly to know was whether or not the base or canvas portion of the tire was rusted or naturally cemented by moisture and corrosion to the bottom of the channel, so that it would require some force at least with the hands to separate the tire base from the bottom of the channel?

Objected to as leading, also as immaterial.

1109 A. That is frequently the case when we use slippery paste.

Cross-Examination by Mr. Staley.

X-Q. 27. What makes of tires of the internal two-wire tire have you used?

A. Morgan & Wright.

X-Q. 28. Exclusively?

A. No. I couldn't positively say whether they had used any of the Firestone or not.

X-Q. 29. Could you name any other besides the Morgan & Wright they have used?

1110 A. No, I could not. I know they have had other samples besides the Morgan & Wright, but I don't know whether they used them or not. They may have used others, but I couldn't say positively about it.

X-Q. 30. Did Morgan & Wright furnish the machine with which you put these tires on?

A. They did.

X-Q. 31. You stated that in nearly all cases the rubber cuts through right under the wire before the tire is worn out. What is your understanding is the reason for this cutting through?

A. My reason is that most internal wire tires is that 1111
they have nothing to keep the wires from wearing through the rubber.

X-Q. 32. Have you ever taken these tires off yourself?

A. Taken them off?

X-Q. 33. Yes.

A. Lots of them.

X-Q. 34. Did you ever discover that the joint in the wire or wire bands, where they have been brazed together, are not in the same position in the tire or on the wheel when you take them off that they were when the tire was applied? 1112

A. That is something that I couldn't swear to.

X-Q. 35. You never noticed that particularly?

A. Not that I remember of.

X-Q. 36. I show you a sample of a tire here, which is one of tires marked "Defendant's Exhibit Eighme's Three Destroyed Usual Sample Cement Rusted Tires," this being the longer piece, showing cuts in the bottom, and will ask you if that tire is like or similar to those you refer to as being cut through at the bottom?

A. Sometimes, not always.

X-Q. 37. How do they differ from this? 1113

A. They differ sometimes by being a clean cut right through.

X-Q. 38. Well, is it not a fact when these wires cut through at the bottom that you find the canvas worn off substantially as shown in this sample?

A. Not always.

X-Q. 39. Generally speaking, though, this is true, is it?

A. Generally speaking, yes.

X-Q. 40. Do you know what wears this canvas off this way?

1114 A. No, I don't know. I couldn't say what wears it off. Some of it comes off and some don't.

X-Q. 41. You have spoken about the hammering, also rolling the tire, to cause the ends to be forced together after the wires are tight. Did you ever know these tires to open up at the joint after that is done, in use?

A. I have.

X-Q. 42. There is nothing to prevent these tires, or the rubber part, from moving in the channel except the friction between the rubber and channel, caused by tightening the wires against the rubber lying under the wires, is there?

1115 A. The way you put that question, there is not.

X-Q. 43. If a roller such as you referred to pressed down on the rubber will cause the rubber part of the tire to move in the channel so as to close up a gap, what would be the effect of putting a heavy load on the wheel with the rubber on the ground and rolling it along; wouldn't that have the same effect as putting the pressure on with a roller and rolling it along the tire?

A. It would not.

X-Q. 44. Why not?

A. Because the pressure of that little wheel that forces
1116 the rubber is all in one place; it simply holds the rubber there in place while you pull the wheel around and slides the rubber on the channel, so that it comes in contact with the other end of the rubber. A heavy load on that rig there would be simply weight there.

X-Q. 45. But this little roller you speak of does in fact roll along the tire when the wheel is turned so as to act on the rubber throughout some little distance of the same, does it not?

A. It does.

X-Q. 46. And to that extent it would be substantially the same as the pressure on the wheel caused by a load

on the wheel rolling over a surface, as the load on the wheel would be at only one place initially, namely, at the point immediately under the axle; is that not true? 1117

A. I wouldn't consider the pressure of the load as great as the wheel.

X-Q. 47. Oh, I understand your idea now, I think. You think it would not be the same because the pressure of the load on the wheel would not be as great as that put on by the small wheel or roller; is that right?

A. Yes.

X-Q. 48. But let us suppose that you so put the same amount of pressure by loading the wheel as I have described, this pressure coming at one place only in the street, immediately under the axle, and then rolling the wheel along with this load on it. Would this not be quite similar to rolling the roller over the tire with the same pressure on it? 1118

A. It would not.

X-Q. 49. Well, now, please explain to the court why not, in your opinion.

A. Because the little roller doesn't cover as much space as the ground would on the bottom of the wheel.

X-Q. 50. Then, the difference, in your opinion, is only that difference which results from the less surface engaged by the roller than that engaged by the floor or ground, is it? 1119

A. The difference is between the roller and the base that the wheel is laying on when it is loaded.

X-Q. 51. In either case, however, the rubber, as a matter of fact, would be compressed so as to bulge out to some extent, both in front of and behind the point where the pressure is applied, would it not?

A. Certainly.

X-Q. 52. And it is the rolling of this roller up against this bulged portion, and as it were attempting to pass

1120 over it, that causes the end of the tire or rubber to move in the channel to close up this space, is it not?

A. That is the case.

X-Q. 53. About how far back, or how far away from the end of the rubber, do you start this roller in sliding the tire in the channel to close up the space?

A. We start about six inches from the end; then go back about a foot from the end the second time, and then we move back about six inches more, and then go over the same manœuvres again until we finally get it to gather. That altogether depends upon whether the surplus rubber is gathered within a space of 2 feet or allowed to
1121 gather the full length of the surface of the wheel.

X-Q. 54. If the surplus rubber had been allowed to gather in the full length of the surface of the wheel do you then allow the rubber to travel almost entirely around the wheel?

A. Pretty near.

X-Q. 55. The object, of course, is to slide this tire in the channel at any point where there is surplus rubber, so as to distribute the rubber as evenly as possible around in the channel, is it not?

A. Yes.

1122 X-Q. 56. And how many times on an average do you repeat this operation of rolling as you describe in order to close up the space?

A. Does that apply to me only, or everybody?

X-Q. 57. Give your own experience.

A. The way I put tires on it generally takes about a dozen and a half times to close up.

X-Q. 58. And how large is the space about when you start to close up?

A. Four inches.

X-Q. 59. I suppose the less you take at each time the

more apt you are to get the rubber evenly distributed; is 1123
that right?

A. No, that's not the case. It won't work up only just a certain space. Just a small distance. That depends on how tight the tire is put on.

X-Q. 60. Did you ever use any other method of drawing the tires together except the two you mentioned?

A. Used a square club for coaxing them together. I never used any other except the club and the roller, but they do use them.

X-Q. 61. Did you ever see any of the other methods used?

A. Never. 1124

ALBERT BUBSER.

Recess.

Thereupon defendant called as a witness, in defendant's behalf, MR. ROBERT H. WENZ, who, being first duly sworn, testified as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Robert H. Wenz; 32; 1667 North Sawyer avenue; well, I don't know how I would state that; carriage 1125
painting and rubber tire.

Q. 2. Are you connected in any way with or do the rubber tire work of any of the leading liverymen of this city, or companies?

A. The Kentucky livery.

Q. 3. Where is that livery located?

A. 503 West VanBuren.

Q. 4. And where is your shop located?

A. 503-505 West VanBuren.

Q. 5. Upon the West side of this city; how large a

1126 business is done by the Kentucky Livery Company in comparison with the other liveries?

A. As far as their livery business is concerned, I should judge about one-third.

Q. 6. Are you familiar with the application and use of rubber tires to wheeled vehicles like the tire of the Grant patent in suit which I now show you?

A. I am.

Q. 7. How long have you been familiar with the application and use of this tire to wheels?

A. About two years.

1127 Q. 8. Do you either apply or take off these tires to wheels other than for the Kentucky Livery Stable, as you have described?

A. I do.

Q. 9. How many, approximately, of these internal two-wire tires, like the patent in suit, have you put on or taken off within the last two years?

A. From 400 to 500.

Q. 10. What do you do with the rubber tires that you take off of the wheels?

A. Sell the rubber as junk.

Q. 11. How much do you get for it?

1128 A. From 6 to 8 cents a pound.

Q. 12. For what reason in your shop do you take off these old tires and sell them for junk?

A. Because they are broken and worn out.

Q. 13. How are these tires broken?

A. Some are channel cut, some are wire cut, some the rubber is broken, and some completely worn down.

Q. 14. What part of these tires, or portion of them, is channel cut and wire cut?

A. About three-quarters.

Q. 15. What part of each tire is so cut; I mean top, bottom or side, of the tire?

A. Sometimes on the bottom and sometimes on the side. 1129

All these questions and answers objected to as incompetent, unless the devices are produced, also as immaterial.

Q. 16. How many of these 400 or 500 tires that you have taken off during the last two years have been worn out to the channel before cutting out at the sides or bottom, as you have described? State approximately the percentage of such tires that are worn out before they are destroyed by cutting.

Objected to as incompetent, and also as immaterial. 1130

A. About one-quarter.

Q. 17. After you have clamped these tires in position by the machine, as you have described, and drawn the two internal wires so tight that they cannot be drawn tighter without breaking, please state with a tire so put on whether or not you have ever known yourself, or have ever heard of such a tire rising or falling or tilting, or the wires rising, falling or tilting by any kind of a strain, no matter how severe, that has ever been put upon the tires in the worst conditions of travel over the car tracks and streets of this city? 1131

Objected to as leading, incompetent and immaterial.

A. Not without breaking the wires.

Q. 18. Of the four or five hundred tires that you have taken off of these wheels in this city during the last two years, have you ever found the base of such tire held fast or stuck to the channel rim by the canvas or tire, rusting or naturally cementing in that position?

Last objection repeated.

A. I have.

Q. 19. How frequently have you found this condition

1132 to exist, and how much force would it take to tear or remove the tire from the channel base?

A. I have had about 10 per cent., and occasionally it is necessary to use a chisel to remove the old rubber.

Cross-Examination by Mr. Staley.

X-Q. 20. Do you conduct a business of your own, and if so, under what name?

A. I do, under my own name.

X-Q. 21. Your shop is a part of the livery stable, is it, or located in the livery stable?

A. Located above the livery stable.

1133 X-Q. 22. Do you buy the rubber direct from the rubber company?

A. I do.

X-Q. 23. What make of rubber do you use?

A. Not any in particular. I use all of the different rubber.

X-Q. 24. Name some of the different kinds that you have used, and especially that you are using at the present time.

A. Hartford Rubber Tire, Dryden Rubber Tire, Consolidated Rubber Tire Company, Goodyear Rubber

1134 Tire Company, and Morgan & Wright and Firestone.

X-Q. 25. Ever used any Diamond rubber?

A. I have used one tire, white rubber.

X-Q. 26. What do you pay per pound for rubber tires now?

A. Generally 55 cents.

X-Q. 27. Buy any for less than that?

A. Second grade, 45.

X-Q. 28. Do you use some second grade?

A. I do.

X-Q. 29. What particular makes of second grades do you use?

A. Hartford. 1135

X-Q. 30. What kind of vehicles do you apply tires for particularly?

A. Carriages and street cabs.

X-Q. 31. If, as a matter of fact, the rubber tire in one of these channels should tilt, or the wires raise, or the rubber raise slightly from the rim by being forced against the street car track, would you be able to know whether it did or not?

A. I would not.

X-Q. 32. There is nothing to hold these tires from moving in the channel except the friction caused by the compression of the rubber lying between the wires and 1136
the bottom of the channel, is there?

A. I don't quite get the meaning of that.

X-Q. 33. I mean that there is no rigid fastening between the rubber and the channel, or the rubber and the wheel, the rubber is held in place by these two retaining wires, the ends of which are united together to form hoops or bands, and these hoops or bands are drawn tight enough to bind the rubber firmly into the channel by compressing or forcing the part of the rubber which lies between the wire and the channel against the channel so that it is merely the friction between the rubber and 1137
the channel caused by the tightening of the wire that holds the tire in place; is that right?

Objected to by defendant's counsel because manifestly the clamping of the base of these tires fabric and rubber to the tire channel is in no sense friction.

Complainants' counsel suggests that the defendant's counsel should give the witness a chance to answer the question without attempting to answer it in the form of an objection on the record.

A. No, I wouldn't say it was.

X-Q. 34. Where do you say that it is wrong?

1138 A. The wires drawn tightly and brazed together will hold the rubber in the wheel if put on tight enough.

X-Q. 35. Of course it will hold it in the wheel, but it holds it simply by reason of the friction between the rubber and the channel, there being no rigid connection between the rubber and the channel; is that right?

A. There are sometimes used a paste or glue between the base of the tire and the channel which would help to hold the tire in place to a certain extent.

X-Q. 36. Leaving out of the question the paste or the glue and assuming it was put on just as Mr. Offield has described to you, then is it not a fact that it is merely the
1139 friction between the rubber and the channel which will prevent the rubber from moving in the channel if it is prevented?

A. I don't quite see clearly through that.

X-Q. 37. Well, you know that there are no rigid connections which positively connect the rubber to the channel, like if you would bolt it on or anything of that kind, do you not?

A. Nothing but the wires.

X-Q. 38. And it is a fact also that after you have drawn these wires tightly and made them as tight as
1140 necessary to hold the tire in place and brazed or otherwise connected the ends of the wires togethr to form bands or hoops, you do move the tire or a part of it at least in the channel to close up the space that was left while you were brazing the wires together; is that not right?

A. We do move part of the tire.

X-Q. 39. And in moving this tire slides along the channel and along the wire and what you do is to overcome the friction between these two parts to make it slide; is that right?

A. In what sense do you use the word "friction" there? 1141

X-Q. 40. I use it in the ordinary sense. Any two parts that moves one on the other would generate friction. The greater the friction the harder it is to move, but if there is no rigid connection between the two, only weight or pressure holding them together, I assume that it would be necessary to overcome the friction between the parts that move one on the other. With this understanding please answer the last question.

A. I do.

X-Q. 41. Now you spoke about some tires which you found stuck to the channel. Do you find the wires cut through and also stuck to the channel on the same tire? 1142

A. I do not.

X-Q. 42. You spoke about one case where you had to take a chisel. What kind of a wheel was this?

A. A wheel from a street cab.

X-Q. 43. When did this happen?

A. About the middle of the summer.

X-Q. 44. Have you got the tire that you took off that way?

A. I have not.

X-Q. 45. Do you know what became of it? 1143

A. It was sold for junk.

X-Q. 46. Did you see the cab or was this wheel brought to you to be prepared or how did you get it in your possession?

A. The cab was brought there for me to put on the new tire.

X-Q. 47. Whose cab was it?

A. That I don't remember.

X-Q. 48. Remember what kind of a tire it was, what make?

A. That would be impossible to tell.

1144 X-Q. 49. What size tire?

A. As near as I can judge it was an inch and five-eighths.

X-Q. 50. Do you know where the cab had been used before it was brought to you and how long the tire had been used?

A. No, I don't know.

X-Q. 51. Was it an old cab or comparatively a new one?

A. Old cab.

X-Q. 52. Was there any dirt or any accumulation of dirt under the tire?

1145 A. Nothing but a little rust.

X-Q. 53. What wheel was it, a front wheel or a hind wheel?

A. Front wheel.

X-Q. 54. What kind of a chisel did you take to pry it off?

A. Ordinary cold chisel.

X-Q. 55. Did you cut the wires first?

A. I did.

X-Q. 56. Had this wheel been in the water a short time before it was brought to you?

1146 A. I presume it had.

Objected to by defendant's counsel because as a matter of course all wheels have been in water.

X-Q. 57. How long had it been standing before you took the tire off?

A. I don't know.

X-Q. 58. Did you ever notice that in cutting the wires on these old tires that the joints in the wires were not always opposite the joints in the rubber and were not always opposite each other?

A. I have seen them that way.

X-Q. 59. Do you know how they got that way?

A. I presume by being loose enough to creep. 1147

X-Q. 60. What do you mean, the wires would creep inside of the rubber?

A. They could.

X-Q. 61. Well, is that what you meant?

A. Yes, that is what I meant.

X-Q. 62. So that it would be possible for the wires to move independently of the rubber?

A. They would if they were loose enough

X-Q. 63. And the wires could move independently of each other?

A. They could.

All those answers of the witness as to the condition of tires not produced objected to as incompetent, also as immaterial. 1148

ROBERT H. WENZ.

Thereupon defendant calls as a witness in defendant's behalf, Mr. FRANK C. GORMAN, who being first duly sworn, testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Frank C. Gorman; 47; 642 42nd street; I am manager for Bane Brothers Livery Company 1149

Q. 2. How long have you held that position?

A. Well, six years.

Q. 3. How extensive is this livery company engaged in the livery business in this city as compared with its competitors?

A. Well, we have about fifty rigs, I guess. I have twenty-five drivers, and I think we do as much and possibly a little more business as most of the other liveries.

Q. 4. Are you familiar with the solid internal two-wire rubber tire as used on cabs and vehicles and espe-

1150 cially on the vehicles of your employer like the solid two internal wire rubber tire shown and described in the Grant patent in suit which I now show you?

A. Yes, sir.

Q. 5. How long have you been familiar with this tire?

A. About ten years, I guess; ten or twelve years.

Q. 6. Have you personally during that time directed the putting on and the taking off of such tires?

A. I have directed the taking off of those tires, and ordered them on, of course.

Q. 7. Who have put these tires on the wheels you use during the last eight or ten years?

1151 A. Firestone Rubber Tire Company, Consolidated and the Diamond; I guess that's all.

Q. 8. During the last eight or ten years how many of these tires have you personally attended to the removal from the wheels for any reason, and how many have been ordered on by you during that time?

A. Probably thousands of them.

Q. 9. What did you do with these tires that you personally directed to be taken off of the wheels for any purpose?

A. Sold them for junk.

1152 Q. 10. About how much did you get for them?

A. Oh, 3 or 4 cents a pound; something like that.

Q. 11. In these tires that you have had removed from wheels like the tire of the patent, in what condition was the tires when removed or what was the reason of the removal?

Objected to as incompetent and calling for conclusions and opinions of the witness, and also as immaterial.

A. Why, the condition of the tires were, well, they were worn out; some of them were cut out from the sides, and some worn down to the channel and it was

necessary to have a new tire on, so in taking off the rub- 1153
ber I would find the bottom cut out and very often rusted to the bottom of the channel.

Q. 12. About what proportion of these tires that you have taken off of wheels for the last eight or ten years have been worn out by being worn down to the channel upon the tread of the tire in distinction to being worn out or destroyed by cutting out through the wires at the sides or bottom?

Objected to as immaterial.

A. Well, I guess the half of them were cut out at the bottom.

Q. 13. In taking off these hundreds or thousands of 1154
tires for the last nine or ten years what has been the usual conditions that you found as to these tires as to the base or the tire or canvas portion being rusted to or naturally cemented to the bottom of the channel rim by corrosion or rust?

Question objected to, first, as stating a good many matters not borne out by the testimony of the witness; and second, as immaterial, also as incompetent, the witness not having qualified sufficiently to give an estimate of this kind.

A. Well, nearly all the tires that I have had taken off 1155
were rusted to the channel and sometimes it was hard work to get them off; on account of the accumulation of rust they were cemented to the channel.

Q. 14. Usually what force would you have to use on them to separate or tear the tire away from the channel?

A. We would have to pull on them considerable.

Q. 15. Have you ever found an instance or instances in taking off these two internal rubber tires where one or both of the wires themselves were found to be broken and still the tire remain in place and do its work in the channel?

Last objection repeated.

1156 A. Yes, I have known several of such instances.

Q. 16. In these cases what held the tire in the channel, the wires being broken?

A. The rust cemented the rubber right to the channel.

Q. 17. While you do not put these tires on yourself and they are put on by the manufacturers I will ask you if you have ever to your own knowledge, or have you ever heard of one of these tires when put on rightly and tightly lifting or tipping or moving up and down to any extent in the channel, either as to the base of the tire or the two clamping wires when the tire is in actual use and with the roughest usage over or among the car tracks of
1157 this city?

Objected to as incompetent and immaterial for reasons heretofore stated on the record.

A. Why, I have known tires to get displaced, but the minute we find them that way we send them back to be reset. A tire has got to be solid to wear.

Q. 18. The question assumed that the tires were tightly clamped in the rim channel by the two wires. Under these circumstances please state whether or not when so rightly fastened and clamped you have ever known the tires to rise and fall in the channel as to their base, or lift
1158 and reseat themselves by any strain that is put upon them, no matter how severe in actual travel.

Last objection repeated.

A. That would be impossible.

Cross-Examination by Mr. Staley.

X-Q. 19. In your last answer you say "that would be impossible." Do you mean to say that that would be impossible for you to know it if such movement did occur or what did you mean?

A. I mean that the wires would not allow the tire to raise and fall; they would hold it tightly in place.

X-Q. 20. I suppose you know that wasn't the question asked, which was whether you knew of them rising or whether you ever heard of them rising? 1159

A. Well, I would know for the reason that the tire would wear out.

X-Q. 21. You mean, do you not, that that is your opinion?

A. That's my experience.

X-Q. 22. Do you claim to be an expert on rubber tires?

A. I claim to have had ten or twelve years' experience with rigs with rubber tires on, and when one gets loose and shows any looseness it begins to wear out and needs resetting. 1160

X-Q. 23. That doesn't answer the question. I asked you whether you claimed to be an expert on rubber tires?

A. No, I am not an expert.

X-Q. 24. Well, now, please explain to the court why you say it is impossible for this rubber to move or the rubber or wire to move away from the channel under a side strain such as would be encountered in striking the tire sidewise against the street-car tracks.

A. As soon as a rig goes out with a new tire on and comes back I can tell whether it is tight or not, and if it isn't tight it will show wear on some side of it. 1161

X-Q. 25. But this does not answer the question. You have stated unequivocally that it would be impossible for the wire or rubber to move away from the channel under any kind of a strain that would be put upon the tire in use; now what I ask you to do is to explain why this is impossible.

A. If the wires were put on rightly they would hold the rubber in place and I don't see how they could move.

X-Q. 26. Here is a wheel which is marked "Defendant's Exhibit a Standard Rubber-Tired Wheel," and a

1162 witness from the Diamond Rubber Company testified that this tire was put on as tight as he could draw the wire and which was in accordance with their usual practice in putting the tire on. Now I am going to insert this screwdriver under the tire and the wire and raise both from the wheel and I ask you whether you do not see that both the rubber and the wire are raised up under the action of the screwdriver?

Defendant's counsel objects to this manner of examining the witness as not cross-examination or rightfully related in any manner to the facts concerning which the witness has testified; that admit-
1163 tedly no such lifting, bucking up or leverage action can ever be applied to or under the wires of any of these rubber tires, and that the only strain that can be placed upon these internal two-wire solid rubber tires is a strain upon some exposed part of the flexible body of the rubber above the rim and at right angles to the load, and that therefore this pantomime performance of complainants' counsel with the exhibit in question tends simply to confuse the witness and obtain a recognition of what is a self-evident fact that has nothing to do with the direct examina-
1164 tion of this witness or a relevant fact in this case.

Complainants' counsel suggests to the defendant's counsel that if he desires to testify in this case he should take the witness stand and should not attempt to instruct the witness under the guise of an objection; further, that his arguments may just as well be reserved for the hearing.

A. Yes, I saw it.

X-Q. 27. Then these tires are not put on so tightly that it is impossible for the wire and rubber to yield, provided the right kind of strain is put on it; is that true?

A. Yes, there is naturally some elasticity in rubber.

X-Q. 28. And it is also true, is it not, Mr. Gorman, 1165
that if such an action did take place with a new tire or a tire tightly applied while in use that you would not from the very nature of things know it and could not know it inasmuch as the parts would be concealed; is that right?

A. Well, I presume I wouldn't notice the slight movement of the rubber.

X-Q. 29. Have you always during your six years of management taken off your rubber tires at your livery stable?

A. I always have had them taken off under my supervision when they were worn out.

X-Q. 30. About how long do these tires wear before 1166
they are worn out?

A. From a year to a year and a half.

X-Q. 31. What particular make of tire, if any, are you using at the present time?

A. Firestone tire mostly

X-Q. 32. Were none of these tires that you have used taken off at the places where they are retired?

A. Oh, yes. The tires that I wanted reset to be used again would be sent to the shop. Those that were worn off of course I would keep and take them off at the stable and sell them for junk. 1167

X-Q. 33. And that has been your custom during the entire six years that you have been manager?

A. Yes, sir.

X-Q. 34. When you order a set of tires that are worn out to be removed do you always remain and see them actually taken off?

A. Not always, but as a rule I do.

X-Q. 35. Wouldn't there be a good many that would be taken off during your absence?

A. No, there would not for the reason that they are taken off in front of the office and right where I can see

1168 them and the tire is always shown to me before I have it taken off to see whether it pays to have it taken off and reset.

X-Q. 36. You spoke of an incident, as I understood you, where both wires were broken in a tire and that the tire ran and gave service after both wires were broken. On what kind of a vehicle was that, when did it happen, and tell all you know about it?

A. I don't mean to say that a tire without any wires will go on and give service, but tires have been discovered with the wires loose or out and broken and the rubber stuck to the channel. Of course I had this tire immedi-
1169 ately taken off and sent to the shop. And the rig, oh, it happened on different rigs, I guess, broughams, carriages.

X-Q. 36*a*. Well, do you mean to say that they run with one wire broken or both wires broken?

A. Sometimes I would find a wire broken in a tire and we would be very busy and could not send it to the shop and would send it on another job, and find that when it made several other trips the other wire would be broken and still the tire stay there. It won't run very long with one wire.

X-Q. 36*b*. How long would it run with two wires
1170 broken?

A. I wouldn't want to send it on a job at all with two wires broken. Still it might go.

X-Q. 36*c*. Well, can you state any one specific and name the carriage and the driver where you had a tire that actually run and stayed on the wheel for any considerable length of time after both wires were broken?

A. No, I cannot.

X-Q. 37. Did you ever have an instance where the driver brought the tire back with him in the vehicle on account of having come off by both wires breaking?

A. Yes, sir.

X-Q. 38. I think you testify that you sell your old rub- 1171
ber for 4 to 5 cents a pound. Other witnesses have testified here that they got from 6 to 10 cents a pound for this old rubber. I suppose you get the market price, do you not?

A. Sometimes this old rubber was weighed and sometimes it wasn't. Sometimes I would sell it in just a bunch, you know.

X-Q. 39. So you don't know whether you got the market price or not?

A. No.

X-Q. 40. Can you state what you pay for new rubber tires or rubber, or do you buy the rubber by the pound? 1172

A. This last three months we have been buying it by the pound and I don't just remember what we did pay for it; 12½ or something of that kind. I don't keep the books, of course; I am in charge.

X-Q. 41. You stated in your examination among your early answers that these tires when taken off you "would find the bottom cut out and very often rusted to the bottom of the channel." You found both of these conditions to exist in the same tire, did you?

A. Yes, sir.

X-Q. 42. Do you know what makes them cut out at 1173
the bottom?

A. On the internal wire tire the water works down between the rubber and the channel and forms the rust and rots out the canvas on the bottom of the rubber and makes it adhere to the channel.

X-Q. 43. And that is what makes it cut out?

A. That is one of the causes, I think.

X-Q. 44. I show you a sample of a tire here that one of defendant's witnesses introduced as an old tire which had been cut out and marked, the entire bunch, "Defendant's Exhibit Eighme's Three Destroyed Usual Samples

1174 Cement Rusted Tires," and ask you if that is substantially like the tires that you refer to?

A. Yes, sir.

FRANK C. GORMAN.

Adjournment taken to Thursday, January 9, 1908, 10 A. M.

Chicago, Illinois, January 9, 1908. Met pursuant to adjournment. Present, same as before.

Defendant's counsel here offers in evidence two depositions, duly certified, given by the patentee Grant in litigations upon his patent, and offers them
1175 for two reasons, first, to show the inaccurate character of the admissions of complainants' counsel entered at New York, December 23, 1907, as to the purpose of the use of cement, varnish or shellac by the patentee Grant and one of the complainants in the early employment of the devices of the patent in suit; and second, to show the fallacy and absurdity of the alleged discovery of an expert in this case that the tires of the Grant patent applied by the utmost tension of the wires without breaking will permit any tilting or adjusting of the tire between the
1176 wires and the base by any tilting or rising or falling of the wires or tire themselves, viz., deposition of patentee Arthur W. Grant in the case of *The Rubber Tire Wheel Company* v. *Columbia Pneumatic Wagon Wheel Company* in the U. S. Circuit Court for the Southern District of New York began April 9, 1897, and requests that the same may be marked "Defendant's Exhibit Patentee Grant's April 9, 1897, Deposition;" also second deposition of said patentee Arthur W. Grant in said case begun August 10, 1898, and requests that the same may be

marked "Defendant's Exhibit Patentee Grant's Au- 1177
gust 10, 1898, Deposition."

By Mr. Staley: Complainants' counsel offers no objection to the introduction of the said depositions or certified copies thereof. He does, however, seriously object to the so-called statement of reason as being wholly uncalled for and unfair and as an attempt to mislead the court as to the conduct or intent or acts of complainants' counsel; calls attention to this record made on December 23rd in New York in which it was stated by complainants' counsel that he was perfectly willing that defendant's counsel should introduce certified copies of Grant's depositions without objections, but as to just what this testimony was he would not attempt to admit, but did admit that he was "of the impression that Grant testified in the Goodyear or Kokomo cases that sometime prior to 1897 his company tried the use of cement, varnish or shellac placed inside of the steel channel iron for preventing excessive creeping—somewhat for the same purpose as the anti-creeping device hereinafter explained; that such use of cement, varnish or shellac was soon abandoned as unsuccessful." 1178 1179

Complainants' counsel challenges defendant's counsel to produce anything in this record or off the record to show that complainants' counsel have not acted in good faith to permit defendant's counsel the fullest latitude in the making up of its record for this case, and also states that they have at considerable personal inconvenience stood ready at all times and at any moment to attend upon defendant's counsel on the taking of its proofs, and that defendant's counsel has not, in complainants' judgment, shown any attempt whatever to consult the conve-

1180 nience of complainants' counsel or shown any appreciation of the fact that complainants have extended every possible convenience in the way of attendance and otherwise to permit defendants to secure a full, comprehensive and complete record in the shortest possible and most speedy manner, and in support further the way in which testimony has been taken. He calls attention to the fact that defendant's expert Pond in his direct and indirect examination consumed between nine and ten days with a record of something less than 100 manuscript pages; that his cross-examination consumed about two and one-half
1181 days with a record of about forty manuscript pages; that during the past week that the average time of taking depositions in this case has not exceeded three hours a day; that complainants' counsel has been ready at all times and willing at all times to put in all the time that is necessary; that he has no other business in Chicago except to attend upon these depositions. Complainants' counsel is further advised and he believes the record will bear him out, that the same dilatory methods were followed in taking of depositions at New York and in the taking
1182 of depositions at Chicago during the last week, and for these reasons we beg to submit to the court that the foregoing statement of counsel in the attempt to cast any reflections on complainants' counsel is wholly uncalled for, unfair and unjust, and not supported by anything in this record.

Defendant's counsel states that the record he believes will show that no attempt has been made to "cast any reflection" on complainants' counsel, but simply that complainants' counsel was mistaken as to the facts in the admissions made by him upon the

record upon December 23, 1907, as shown by the 1183
patentee Grant's deposition.

As to the rest of the statement of complainants' counsel on the record defendant's counsel calls attention of the court to the fact that complainants' counsel attempted at New York to set this case down for trial without any testimony being taken upon the part of defendant, and that they succeeded in having the court enter an order that forty days only be given the defendant to put in its entire case; that on account of holidays and Sundays and the impossibility of obtaining witnesses this forty days represented probably not more than thirty days of 1184
actual available time. Further, that the record of other cases upon this patent show, we believe that something over two or three years was occupied by both parties in the preparation of several records, with exception possibly of the Firestone case; that manifestly it is simply impossible to take testimony in the principal cities of the United States as was done in the other cases of a testimony of the character now being produced; the distance apart of travel and the necessary time incident, the trouble and inconvenience of witnesses would necessitate a 1185
much longer period of time than the forty days, but defendant's counsel believes that more than unusual diligence has been followed by defendant in the utilization of the forty days assigned by the court for the taking of this testimony, and will be continued until the expiration of the time upon the evening of the 11th inst., and at that time defendant's counsel will put upon the record a question and a request to complainants' counsel to test the sincerity of the statement that complainants' counsel have extended every possible convenience in the

1186 way of attendance and otherwise *to permit defendant to secure a full, comprehensive and complete record in the shortest possible and most speedy manner.* In reply to the reference of complainants' counsel to the self-sacrificing character of their attendance upon the taking of this testimony under the short time rule obtained by themselves defendant's counsel calls the court's attention to the fact that while he alone of necessity has taken this testimony in behalf of defendant, the complainants have available three different counsel who have alternated in attending upon this testimony.

1187 By Mr. Staley: In reply complainants's counsel states there seems to be a decided difference of opinion as to whether or not defendant's counsel has proceeded in the most expeditious manner, and witness the fact that it is now 11 o'clock and there is no witness present, and had there been a witness much of this record would have been eliminated; witness also the fact as testified to by the witness Edgerton, he was dismissed at 2:45 on one day and adjournment taken fifteen minutes later for lack of witnesses, but as before stated, this is a difference of opinion which

1188 may perhaps be decided later by proper authority.

Recess from 12:30 until 2 P. M.

Thereupon defendant called as a witness, in defendant's behalf, Mr. HOMER C. KNIGHT, who, being first duly sworn, testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Homer C. Knight; 36; why. Chicago; carriage trimmer.

Q. 2. Are you familiar with the two internal wire

solid rubber tires that is shown by the Grant patent in suit that I now show you? 1189

A. Yes, sir.

Q. 3. How long have you been familiar with those tires in this city?

A. About nine years.

Q. 4. In what manner did you become familar with them during that time?

A. In, well, I would say dealing in rubber tires, selling rubber tires.

Q. 5. What has been your business during the last nine years?

A. Carriage repairing. 1190

Q. 6. At what place in the city?

A. Been in business on 16th street; 2129 Indiana avenue; presently located at 1725 Michigan avenue.

Q. 7. As proprietor during that time?

A. During the entire time.

Q. 8. For the last nine years, how many tires would you estimate that you had either put on or had put on your vehicles or taken off? Solid rubber tires, I mean, like the tires of the Grant patent. Give your best estimate.

Objected to as irrelevant and immaterial. 1191

A. Well, probably in the neighborhood of 500.

Q. 9. When you put these two internal wire tires on your wheels yourself did you put them on by hand or by machine?

A. Put them on by machinery.

Q. 10. How tight did you stretch each of the two wires when you fastened or clamped the rubber tire in position on the wheel by brazing them?

A. Well, as tight as the rubber would stand without the wire cutting through.

Q. 11. What tension would this put upon each of the

1192 wires? How tight would the wires be drawn by the machine?

Question is objected to as irrelevant and immaterial because it has been conceded that the wires are drawn tightly and there is no dispute about that and it is merely a waste of time.

Defendant's counsel asks complainants' counsel if by this statement he admits that the testimony of several defendant's witnesses are true as to this matter, namely that the tires are drawn as taut as they will stand without breaking?

1193 Complainant does not admit that they are drawn to the breaking point, as it is quite evident that if they were they would break under the strain, but he does admit that they are drawn as tightly as a reasonable limit of safety within breaking strain of the wire will permit.

A. It has been my experience that the wires were drawn as tight as they could possibly be drawn.

Answer objected to as incompetent, as the witness has not been shown to have had any experience that would enable him to testify on the subject.

Q. 12. Mr. Knight, in these tires that have been fas-
1194 tened in position by these two internal wires by stretching them or straining them as tightly as they can be drawn, have you ever known yourself or have you ever heard of one of these tires so applied lifting or tilting or moving up or down in the channel or the base of the tire so doing in any way under any strain, twisting, side thrust or other of the severest tests to which a wheel may be put in travel over the streets and among the car tracks of this city?

Question objected to as incompetent, irrelevant and immaterial. Incompetent because the witness is not shown to have any special knowledge or op-

portunity to know; or made any tests, without which it would be impossible for him to know from the very nature of things; and, as is clearly shown by admissions of practically all of the witnesses, and as to what he may or may not have heard is obviously immaterial and also incompetent. 1195

A. Never heard of only in case of one wire breaking.

Q. 13. In what manner are these tires destroyed? I mean as to what happens to the tire to destroy it in the actual use of the wheel without wearing out.

Question is objected to as leading; also as incompetent, calling for conclusions and for secondary evidence, the witness not having qualified as an expert or one having personal experience as to matters inquired of, and further as incompetent, the devices referred to not being produced. 1196

A. It breaks out from where the wires are on each side.

Answer is objected to as stating a conclusion, and for the reasons before stated.

Q. 14. In these rubber tires that you remove from the wheel rim, what do you do with them?

Question objected to as irrelevant and immaterial.

A. I have sold most of them for junk. 1197

Q. 15. In these rubber tires that you have removed from wheels during the last eight or nine years, in what condition do you find the base of the tire and the fabric in relation to the channel rim?

The objection to question 12 is repeated to this question.

A. In the majority of cases I found the fabric rusted to the channel.

Q. 16. To illustrate this matter, I suppose the first thing you do when you propose to remove one of these tires from the rim is to take a cold chisel and cut the wires practically opposite to each other; is this right?

1198 Last objection repeated. Also objected to as leading.

A. Yes, sir.

Q. 17. What happens then to the tire when the clamping wires are thus cut in the removal?

A. The tire springs up 4 or 5 inches each way from the joint where it is cut.

Q. 18. Then what do you have to do?

A. Usually strip the tire from the rim.

Q. 19. What force is necessary, approximately, to tear the tire from the rim, and do you do it with your hand or with a machine?

1199 Last objection repeated.

A. Not enough force except that you could use by hand.

Q. 20. Out of every ten cases as a standard of comparison, how many of these ten tires would be thus rusted or cemented to the rim by rust so that it would be necessary to pull them apart after cutting the wires by hand?

Objection to question 12 repeated.

A. I should say in the majority of cases almost nine out of ten has been my experience that the tires were rusted to the channel.

1200 Q. 21. State whether or not in any considerable number of these instances that the base fabric of the tire would come off and stick to the bottom of the tire?

Last objection repeated. Also objected to as leading.

A. I have noticed in many cases that the fabric and rubber separate, the fabric remaining in the channel.

Cross-Examination by Mr. Staley.

X-Q. 22. How many men do you employ?

A. At present I am employing twelve men.

X-Q. 23. Who applies and takes off the tires?

A. My blacksmith finisher does some of them. 1201

X-Q. 24. Give the names of your employees who do this work.

A. William Fifer, and I have forgotten one fellow's name; Joe Padome.

X-Q. 25. When and by whom were you asked to testify in this case?

A. I was asked by Mr. Harmer, of the Diamond Rubber Company, last evening.

X-Q. 26. Was this question of the so-called rusting of the tires in the channel talked over at that time by Mr. Harmer and you or has it been since?

A. Nothing in that respect. 1202

X-Q. 27. When was the question of this so-called rusting of the tires in channel first brought to your attention?

A. By Mr. Offield in the other room about ten minutes ago.

X-Q. 28. You had not given the matter any special thought, then, before that time?

A. No, sir.

HOMER C. KNIGHT.

Thereupon defendant called as a witness in defendant's behalf Mr. FRED KRUMBICK, who being first duly sworn, testifies as follows in answer to interrogatories propounded by Mr. Offield: 1203

Q. 1. Please state your name, age, residence and occupation.

A. Fred Krumbick; 40 years old the 24th day of last July; 7523 Goldsmith avenue; carriage painter and rubber-tire setter.

Q. 2. Have you even been connected with any of the large livery stables in this city in the equipment of wheels of their rigs with rubber tires?

A. Yes, sir.

1204 Q. 3. Who was the party?

A. Moxley Livery Company.

Q. 4. Where are they located?

A. 541 West Van Buren street.

Q. 5. How long were you with Moxley Livery Company at that place?

A. About six years.

Q. 6. What six years?

A. Well, I left them just before Christmas. The six years previous to that. The 13th of January I would have been with them six years.

1205 Q. 7. What was your position with the Moxley Company during those six years?

A. I was the head painter and had charge of all the repairing. Painting and repairing.

Q. 8. During the six years with the Moxley Company how many of these solid rubber two internal wire tires did you put on or take off of the rigs of that company? State as nearly as you can.

A. I should say something like a thousand.

Q. 9. Look at the Grant patent in suit, or the drawings of that patent, and state if these drawings represent the tire you are talking about.

1206 A. That is the tire, but some of them have a little different shape, wings.

Q. 10. In putting on these solid rubber tires for the Moxley Company how did you put them on, with your hand or a machine?

A. Put them on by a machine.

Q. 11. How tight did you draw each of the two wires to fasten the tire to the rim?

A. On a heavy tire we drawed it as tight as two men could pull the wheel around. Of course on a light wire we couldn't pull so hard or we would break the wires.

Q. 12. Then as I understand you you pulled both hard

wires as tight as you could with the machine to lock the tire in place in the rim without breaking the wires? 1207

A. Yes, sir; we pulled them as tight as we could without breaking the wires.

Q. 13. Mr. Krumbick, during the six years that you were putting on and taking off these solid rubber tires to the extent of about a thousand at the Moxley Company, did you ever yourself know or did you ever hear of one of these tires after being wired on as tight as it could be without the wires breaking, of the tire as to its base or the wires lifting and reseating themselves, tilting or rising or falling under any of the severe strains and wrenches that could be put upon the tire in traveling over or among the car tracks of this city? 1208

Question objected to as incompetent, irrelevant and immaterial for the reasons heretofore stated in objections to substantially the same questions put to previous witnesses and particularly as stated in objection 12 in the deposition of the witness Knight preceding.

A. Well, I don't really know how to answer that. I would say no. I have had a few which came loose once in a while. That's about as near as I can answer it.

Q. 14. How many of these thousand tires, approximately, were worn out by the rubber being worn down to the channel before the tire was taken off? 1209

Objected to as incompetent and immaterial for the reasons hereinbefore stated in objections to similar questions in previous testimony, and this objection is made once and for all to all questions put to the witness relating to this same subject-matter, and as to devices not produced.

A. None.

Q. 15. What happened to the tire that it had to be

1210 taken off before its tread or bearing surface was worn out?

A. They were either cut by the channel or the joints would work loose where they were cemented together and in that way they would tear and we would have to take them off.

Q. 16. In these thousand tires or as many of them as were taken off by you during the six years you were with Moxley, what was the condition of those tires as to the base or canvas portion of the rim being stuck to or cement rusted to the channel rim when you took them off?

1211 A. Well, I don't exactly understand your question. Do you mean the way they are stuck in the channel? We used to cut them and most of the time we had to pull them out of the channel.

Q. 17. Do you mean that you cut the wire when you took the tire off?

A. Most of the time we cut the wires unless they were tore off before they came into the factory.

Q. 18. After you cut the wires how much force would you have to use to pull the bottom of the tire free from the channel? I mean did you use your hands in so doing or a machine?

1212 Objected to as incompetent, irrelevant and immaterial.

A. Oh, we used our hands.

Q. 19. State whether or not in tearing the base of these tires from the channel any of the canvas stuck to the bottom of the channel.

Same objection; also as leading.

A. No, sir.

Q. 20. Did the canvas always pull off with the rubber no matter how tight it was rusted in this channel?

Objected to as leading; also as misleading.

A. Yes, sir.

Q. 21. How many rigs did the Moxley Livery Company run that you had charge of as you have described? 1213

A. About thirty.

Q. 22. What kind of rigs were they? I mean as to the type of them.

A. Carriages, broughams, coupés, traps, stanhopes.

Q. 23. State whether or not the livery business of Moxley is a high-class business and known as a higher kind of service of a livery.

Objected to as irrelevant and immaterial, and also as leading.

A. They were considered the best on the West Side.

Q. 24. How does the livery business and service of the Moxley Company considered and how is it as to size of his business compared with the principal liverymen of the West side? 1214

Last objection repeated.

A. Well, they were considered the best, and best service, and largest, too.

Q. 25. Were the Moxley rigs the most expensive and finest in service on the West side?

Objected to as incompetent and calling for opinion, and also as irrelevant and immaterial.

A. They were considered so. 1215

Cross-Examination by Mr. Staley.

X-Q. 26. You state that you were the head painter and had charge of the repairing for this company. Did you have other men under you?

A. I had from 1 to 5 always.

X-Q. 27. What part of the work, if any, did you do yourself?

A. I set all the rubber tires and done all the finishing and striping and all the best part of the work.

1216 X-Q. 28. By finishing and striping you mean painting, do you?

A. Yes, sir.

X-Q. 29. Did you take off all the old tires yourself, or was that done under you by some of the other men?

A. I attend to the tires myself. Took them all off and put them on.

X-Q. 30. Have you noticed in taking off these tires that the wires after they have been in use for a considerable length of time become shaped to the wheel and stiff so that after the wires are cut and the tire removed the
1217 wires would hold the tire in the shape of a band by reason of this stiffening of the wires?

A. No, sir; they would be bent, but not the shape of a wheel. They would fly out as soon as you would pull them off and rather straighten out, not exactly straight, but they wouldn't be the shape of the wheel.

X-Q. 31. Usually, then, when the wires were cut the tire would spring away from the wheel where the wires were cut, at the point where the wires were cut?

A. No, sir; not always.

X-Q. 32. I did not say always, but usually.

1218 A. No, not usually.

X-Q. 33. And you never saw a tire, then, where the wires were stiff in the rubber, that it took some little force to bend it out straight after the tire had been in use for a long time?

A. No, sir; I never did.

X-Q. 34. Did you remove the wires in the rubber?

A. Yes, sir.

X-Q. 35. Did you have any trouble in getting the wires out?

A. If a tire was dry we had lots of trouble in getting them out.

X-Q. 36. What kind of tires, that is, what make of 1219
tires did you use?

A. We used mostly the Goodyear tire and Morgan & Wright and some Kelley Springfield, and some Dryden. I don't know whose make they were.

X-Q. 37. Who furnished the machine that you used for putting on the tires?

A. Goodyear.

X-Q. 38. Do you use the same machine for putting on all the different makes of tires?

A. Yes, sir.

X-Q. 39. When did you use the Kelley Springfield 1220
tire, and about how many?

A. Why, I used about a half a dozen of them for a special customer there in the barn. I put one last year and one the year before and maybe one the year before that. I couldn't say exactly.

X-Q. 40. By special customer do you mean some rig that was not owned by the livery stable?

A. Yes, sir.

X-Q. 41. When and by whom were you asked to testify in this case?

A. I was asked by a man, I don't know his name only by looking at his letter. I received the letter this morn- 1221
ing from Mr. Harmer, and I went over to the office of the Diamond Rubber Company and from there I came directly over here.

X-Q. 42. By Mr. Harmer you mean the gentleman that was just sitting here and who left the room?

A. I don't know whether that was Mr. Harmer or not, but I suppose it was.

X-Q. 43. Well, he is the gentleman that spoke to you and introduced himself when you came in the outer office, isn't he?

A. He spoke to me, but he didn't introduce himself.

1222 I asked him if he was the gentleman that wrote to me and he said "yes, sir."

X-Q. 44. Ever have occasion to tighten up the wires on these tires before you abandoned them, or reset them?

A. Well, you can't tighten up the wires after they are put on once.

X-Q. 45. Well, how about resetting them?

A. Well, you can reset them.

X-Q. 46. Did you ever have occasion to do that?

A. Yes, sir.

X-Q. 47. Very often?

A. Frequently we reset the tires; where the rubber is
1223 good in places.

X-Q. 48. But why would you have to reset them?

A. Sometimes the wires would break or sometimes the joints would be loose and the ends of the rubber would fly out and would get caught and be torn so that we would have to put a new piece in. Or sometimes they would be cut on the sides from the channel being sharp and the rubber would bulge up, which would make it necessary to reset them.

X-Q. 49. Ever reset any because they got loose without the wires breaking?

1224 A. Why, I have set a few that would get loose in some parts or other that perhaps hadn't been put on tight or something, I don't know just exactly what.

X-Q. 50. Ever use any Goodyear wing tires?

A. Yes, sir; we used mostly a Goodyear wing tire.

X-Q. 51. Most of these tires, then, that you were talking about, were the Goodyear wing tire, were they?

A. Might say a little over half of them were Goodyear wing tires.

FRED KRUMBICK.

1225 Thereupon defendant called in defendant's behalf as a witness, Mr. FRANK GLEMBLOW, who being first duly sworn, testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Frank Glemblow; 57; 1442 King place; livery business.

Q. 2. How long have you been in the livery business in Chicago, and where?

A. Since April 1, 1897; Chicago.

1226 Q. 3. While you have been in the livery business in Chicago have you used on your rigs solid rubber tires like the tire of the Grant patent in suit which I now show you the drawings?

A. Yes, sir.

Q. 4. About how many of such tires have you had put on or taken off in your business since the year 1897?

A. Might have been between 400 and 500 Can't give the exact amount of them.

Q. 5. Did you put these tires on?

A. No, I had them put on.

Q. 6. Did you take them off yourself at your stable?

1227 A. Yes, we generally took them off.

Q. 7. What did you do with the old tires when you took them off?

A. Sold them to junk dealers.

Q. 8. For about how much?

A. About 7½ or 8 cents a pound.

Q. 9. Mr. Glemblow, since the year 1897 in all of the solid rubber tires used by you on your different wheels have you ever yourself known, or have you ever heard that these tires on your rigs tilted or tipped or the wires themselves rose and fell in any way when the tire was

1228 tightly and properly wired on under any conditions of strain or travel that your rigs are subjected to, even the most severe on the streets or among the car tracks of this city?

Question objected to as irrelevant and immaterial and incompetent for the reason heretofore stated in objection to question 12 of Knight's deposition and the similar question in other depositions.

A. No, I don't think so.

Q. 10. Have any of these tires stayed in the rims and worn out by use before they were otherwise destroyed on your rigs?

1229 Objected to as incompetent and calling for conclusions and for opinions, the witness not having shown to be competent or as qualified as an expert to determine such questions, and also for the reason that none of the devices are produced.

A. Well, sometimes maybe one wire break, you know, and we had to take them off and they wore down so much that we couldn't use them any more so we took them off before we send the wheel to the shop to be rerubbered.

Q. 11. How were the tires on your rigs destroyed before they were worn out on their tread or bearing surface?

1230 Objected to on the ground that the witness has already answered the question and being an attempt to get the witness to change his answer.

A. They were generally pieces cut out or busted in some place, fringed out.

Q. 12. Mr. Glemblow, when you come to cut the wires to take off these old solid tires, would the wires on tires spring away from the wheel or would you have to use some force with your hands to separate the base of the tire from the rim channel?

Objected to as immaterial and also as leading.

A. It depends on it. Sometimes the tire is worked loose in the channel, then it would fall off, but whenever we had to cut the wires and the tires was tight enough then we had to pull them off or generally they were rusted together with the base of the channel. 1231

Q. 13. How large a livery business do you do on the North Side in comparison with your largest competitor since the year 1897?

A. Well, at the present time we are doing a business of about two thousand dollars a month.

Q. 14. Well, compare your business as to size with the largest liveryman on the North Side since 1897?

A. That's a question I can't answer very well because I don't know how large a business other people are doing. 1232

Q. 15. What I want to know is, Mr. Glemblow, whether you do a large or small business in comparison with the principal liverymen of the North Side.

A. There might be, maybe, two or three larger barns on the North Side than mine is.

Q. 16. About how many rigs, little and big, do you run with rubber tires?

A. About sixteen heavy rigs now; about ten light rigs.

Cross-Examination by Mr. Staley. 1233

X-Q. 17. Where is your place of business?

A.. 1568 North Clark street.

X-Q. 18. By heavy rigs what do you mean?

A. Carriages, broughams and cabs.

X-Q. 19. How many broughams, how many cabs have you and how many have you had during the different years of your business?

A. Well, at present we got about eight carriages, five broughams and three cabs; and might say, five years ago I only had about four carriages and two broughams and two cabs.

1234 X-Q. 20. And in 1897, when you started, how many carriages, broughams and cabs did you have?

A. Had two carriages, two broughams and two cabs, and about three buggies, light ones.

X-Q. 21. Then you have about ten buggies now?

A. About ten, yes.

X-Q. 22. Did you increase the number of buggies this year the same as the others?

A. Yes, about one or two a year.

X-Q. 23. Do you personally cut the wires and remove these old wheels and have you done that with all the old ones that have been taken off at your stable?

1235 A. Not on all of them; some of them.

X-Q. 24. Well, out of the four or five hundred, how many could you say that you actually did the work of taking off?

A. I would say about fifty.

X-Q. 25. Who put these tires on for you? Name the different parties.

A. Firestone Rubber Tire Company, Consolidated Pennsylvania, and—there is another firm—and the Diamond.

X-Q. 26. Is there or has there been a different price
1236 or prices on the same size of tire which you have used?

A. The prices varied sometimes.

X-Q. 27. Do you know whether or not that a few years ago tires were put on the market at a very low price and of rubber that was hardly fit to use at all?

A. I never used any of those. No, I don't know it.

X-Q. 28. Do you know what price by the pound you pay for your rubber tires?

A. I know I never buy it by the pound, generally by the tire.

X-Q. 39. Do you know what grade of tire you use or were you ever quoted prices on different grades?

A. What grade of tire you mean, what grade of rub- 1237
ber?

X-Q. 30. Yes.

A. No, I couldn't tell you that.

X-Q. 31. You mean that you don't know whether you were ever quoted prices on different grades of rubber?

A. No. We couldn't use any cheap rubber so never asked for any prices. Always got the best rubber.

X-Q. 32. What did you pay for an inch and a quarter tire or set of tires for a brougham?

A. Can't use inch and a quarter tire on brougham.

X-Q. 33. State what size you did use and what you 1238
paid for it?

A. Inch and three-quarter. I think it was about $11 a tire.

X-Q. 34. That's $44 for the set of four?

A. Yes.

X-Q. 35. Have you any idea what these tires weighed?

A. What they weighed, no.

X-Q. 36. When and by whom were you asked to testify here?

A. By Mr. Harmer of the Diamond Rubber Company; just today; over the telephone.

X-Q. 37. This afternoon? 1239

A. Yes, sir.

X-Q. 38. You mean the gentleman who is now present here?

A. Yes, sir.

FRANK GLEMBLOW.

Adjourned to Friday, January 9, 1908, 10 A. M.

1240 Chicago, Illinois, January 10, 1908. Met pursuant to adjournment. Present, same as before.

Thereupon defendant called as a witness, in defendant's behalf, Mr. JACOB E. HANSON, who, being first duly sworn, testifies as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation.

A. Jacob E. Hanson; 53 years old; 3508 Indiana avenue; liveryman, retired.

1241 Q. 2. Were you ever in the livery business in this city, and, if so, for how many years and in what part of the city?

A. Been in the livery business twenty years; at 3508 Indiana avenue.

Q. 3. When did you retire?

A. Nineteenth of last October.

Q. 4. Did you ever use in your livery business a solid two-wire internal tire like the tire of the Grant patent in suit now shown you in the drawings of that patent?

A. Yes, sir.

Q. 5. When did you first begin using such tire, about
1242 how many years ago?

A. Well, '93 I had an English rubber tire which I bought C. P. Kimball.

Q. 6. When did you first begin using these Grant tires like the patent?

A. Well, I couldn't exactly state the year, I think it in '94, or early part of '95, I can't just exactly state when it was.

Q. 7. How many such tires did you put on or take off of your wheels or both from the years 1895 to the time you went out of business in October last?

A. Well, something like about 300 tires.

Q. 8. Did you put those tires on yourself on your wheels? 1243

A. No, sir.

Q. 9. Who did put them on?

A. Well, different people, you know; the Goodyear done some of it; Firestone done some of it and the Keeney Carriage Company done some of it; it is on 35th street.

Q. 10. Did you yourself personally take off these internal wire solid rubber tires when they were worn out or destroyed for any reason?

A. Yes, sir.

Q. 11. What did you do with the rubber when you took them off? 1244

Objected to as irrelevant and immaterial.

A. I kept them and until I had a number of amount of pounds of them and sold them.

Q. 12. For how much a pound?

Same objection.

A. It varies, you know. There was a time we got 5, 6, 7 and 8, according to the prices of rubber. I got 7 cents, I got 8 and I got 5, according to the variations of price, you know.

Q. 13. What did you first pay for these tires for your wheels when you bought them? 1245

A. First two sets I paid a hundred dollars a set. Well, they have come down. The different size of the wheel has different prices; 2½ I paid $18; I paid $36 for two wheels, that is, cab wheels. Carriage wheels would run from $10 to $11 the hind and front wheels, apiece; some of them $12. A light buggy wheel would run about $4.50 or $5 apiece. That's about all I can do on that.

Q. 14. Do you know how these parties that put these tires on your wheels actually put them on, whether by hand or by machine?

1246 Objected to as improper and calling for secondary evidence.

A. By machine.

Q. 15. Have you seen them put them on?

A. Yes, sir.

Q. 16. How tight did the machine stretch or pull the wires when fastening the tires in place on your wheels?

Last objection repeated, and further objected to as leading.

A. As tight as the tension would stand on the wire.

Q. 17. Did you ever yourself know, or did you ever hear that the base of these solid rubber tires would lift
1247 from the channel, or the wires themselwes would lift or tilt with any strain that was put upon the wheels of your rigs in the most severe and racking condition of travel on the streets or car tracks of this city, to which they were subjected?

Objected to as immaterial and incompetent and for reasons heretofore stated in objections to similar questions in other depositions, and particularly to Q. 12 of Knight's deposition.

A. No. If they were properly applied they should not do that.

1248 Answer objected to as stating conclusions, the witness having shown no particular grounds or qualification to express expert opinions.

Q. 18. How did these internal two-wire solid rubber tires become destroyed, if at all, before being worn out from the wheels of your rigs? What was the matter with them that you had to take them off?

Question objected to as calling for the opinions and conclusions of the witness about devices not present, therefore incompetent, and also as immaterial; also objected to as leading and suggestive.

A. If the tire becomes loose or was loose when it was

put on it would destroy itself, the wires would cut through the bottom in a very short time and couldn't be used that way. 1249

Q. 19. How about cutting through at the sides of the tire?

Last objection repeated.

A. Well, if the tires is loose the friction of the motion of the rig keeps working it on the channel here and it cuts out on the side.

Q. 20. What proportion of the tires that you used on your rigs were worn out on the face of the tire before they cut out the bottom or sides? I don't ask for exact figures, but give your best judgment? 1250

Question objected to as incompetent and very improper and calling for conclusions of the witness as to matters and things not produced. This objection is made once for all as to all questions involving similar subject-matter.

A. If the tire is firm in the channel and remains so it will wear down to the channel.

Q. 21. Well, out of every ten tires that were put on for you, how many of them wore down to the channel before cutting out at the sides or bottom?

A. Well, the percentage is not very great. 1251

Q. 22. When you removed these old tires from the channel, what did you first do as to getting them off, to the wires?

A. Cut the wires.

Q. 23. What happened when you cut the wires on these old tires. Did the tire itself then come out of the channel?

Objected to as leading and immaterial.

A. It all depends on the condition of the tire. If the tire was loose and had been creeping, why, the tire would come right off, but if the tire had been firm and in its

1252 place and no creeping motion there, why, the rubber would hold on to the channel.

Q. 24. How do you mean would hold on? What would hold it on when the wires, both wires were cut?

A. The corrosion from the water which had accumulated there.

Q. 25. How much force would you have to use to pull these tires off after the wires were cut?

A. Doesn't require great force to pull them out, but they would stay there, though.

Q. 26. Could you pull them off or tear them off of the rims with one hand?

1253 A. Yes.

Q. 27. About what proportion of the tires would come off or away from the wheel when the wires were cut, and what proportion of the tires would stick to the rim by corrosion and had to be pulled off by hand? I don't ask for the exact figures; give your best estimate.

A. Well, the percentage is very small. I wouldn't attempt to give a correct answer to that because I don't know.

Q. 28. The percentage is very small, do you mean, of tires that will fall off when the wires are cut and don't

1254 have to be pulled off by the hand?

Objected to as leading.

A. Yes.

Q. 29. About how many rigs during the last ten years, of different kinds, have you used in your livery business?

A. Twenty-five.

Q. 30. Have you done a large or a small business as a liveryman upon the South Side during that time?

A. Done a pretty good business.

Q. 31. How did it compare in size with your competitors?

A. Well, some are bigger and some are smaller.

Q. 32. During the last years of your livery business 1255
did you use also external wire tires like the wheel now before you marked "Defendant's Exhibit Firestone External Side Wire Tire"?

Objected to as irrelevant and immaterial.

A. Yes.

Cross-Examination by Mr. Staley.

X-Q. 33. Did you personally with your own hands take off all of the 300 tires that you say you used, after they were worn out?

A. I took off the biggest part of them, not saying all 1256
of them.

X-Q. 34. Who took off those that you didn't take off?

A. My son or my foreman.

X-Q. 35. How many do you suppose each of those took off?

A. Well, the percentage they took off is very small because it was my interest and my money and I took care of it myself generally.

X-Q. 36. Were none of the tires never taken off at the shop where the wheels were put on?

A. Yes, sir.

X-Q. 37. How many were taken off by the different 1257
factories or shops?

A. The rubber tires in case they wanted resetting, and of course those were taken off at the shop. If they weren't tight enough of course they must be reset.

X-Q. 38. And were there some taken off at the diferesent shops where they were put on if they were not reset?

A. No, because if they went to the shop we didn't get the price of the old rubber. They took the old rubber and said nothing about it, see.

X-Q. 39. Well, did it never happen that you sent a

1258 tire to the shop to be reset and after it was taken off you were advised to put on a new tire, and did put on a new tire?

A. Yes.

X-Q. 40. In that case the tires were taken off at the shop and not reset, were they not?

A. Yes, it was taken off and not reset if he claimed that he couldn't reset it. It belonged to the mechanic, you know.

X-Q. 41. Was this English tire that you bought of Kimball what was known as the clincher tire?

A. Yes.

1259 X-Q. 42. Those clincher tires didn't stay long on the market in this locality, did they?

A. No.

X-Q. 43. The internal two-wire tire drove them out, did they not?

A. Yes, sir; they did.

X-Q. 44. How many different times have you seen these tires applied; in how many different places?

A. Well, when they came out—the Springfield tire came out—it was a secret and they wouldn't allow anybody to see it. Two or three years nobody was allowed

1260 to see it, but afterwards a man could take his wheel in and go up to the shops and stay and look at it while they were doing the work. (Question reread.) Well, the Firestone; the Diamond Rubber; Chicago Coach & Carriage Company; Chicago Carriage Trimming Company; Keeney Carriage Works; different times I have been there; well, I couldn't tell you; as often as I had to take a tire I couldn't remember; I couldn't state that; I wouldn't try to state that; in twelve years a man can't remember; things jump up in business which you can't remember.

X-Q. 45. In all these places they put the tires on by drawing the wires as tightly as they could, did they?

A. Yes. 1261

X-Q. 46. Now as I understand your testimony, you state in answers 19 and 21 that if the tire stays tight it wears out on the surface, but if it gets loose it wears out in the body. In your estimation there is only a small proportion of them that stay tight; is that right?

A. That is right.

X-Q. 47. If these tires are put on as tightly as they can be put on what makes them get loose?

A. As long as they stay tight there is no wear in the bottom. (Question reread to witness.) Well. the wire may snap off and not being noticed at the time. If they are attended to properly and reset it is of no harm to it. 1262 If let go they will wear out in the bottom.

X-Q. 48. But they get loose without the wire snapping off, do they not, and haven't you testified that you had to cut both wires when the tire was perfectly loose in the channel in taking it off?

A. Sometimes they do; yes, they cut through the rubber. Just a minute. I don't think I have testified to that.

X-Q. 49. Well, in your answer to Q. 22 you said that the first thing you did in removing these tires was to cut the wires; then in the next answer you said if the tire 1263 was loose and had been creeping the tire would come right off. Did you not mean to testify there that in many cases when you cut the wires the tire was loose and would come off?

A. No, that wasn't my testimony there at all. What the testimony was that a tire that wore out if the tire was tight in the channel and it had worn out cutting the two wires the tire would remain; would have to pull it off with the hands. That was the testimony.

X-Q. 50. Well, didn't you say and didn't you intend

1264 to testify that the percentage of the tires which remain tight and wore out in this way was very small?

A. That's what I said.

X-Q. 51. And that the large majority of them got loose and wore out at the bottom?

A. Yes.

X-Q. 52. And that those that did get loose when you cut the wires, the tire would come right off; is that your testimony?

A. Yes.

X-Q. 53. Now, I will ask you again if you know or can state what makes these tires get loose in the channel
1265 in use without the wires breaking?

A. Well, there are different causes. They may not have pressure on the rubber, may not have been rubber enough in, in allowing the tire to work or creep, what we call it, it will make the bottom cut out.

X-Q. 54. Now, that is your own idea, is it, about that?

A. That's my idea, yes.

X-Q. 55. Now, you have also stated that when the tire is held tightly that the water gets under it and corrodes it, but when it is loose there is no such corrosion;
1266 do you think that the water would be more apt to get under a tight tire than under a loose tire?

A. No; well I didn't get that right. A loose tire will work and polish the channel so there is no chances for corrosion. If channel is tight or hold on—or if the rubber is tight in the channel it allows the water, or certain grit, you know, to get in and form a corrosion.

X-Q. 56. I want you now to explain to the court how the water can get in if these tires are as tight as you say they are when they are put on, and if they never raise up or move under strains in use. Please explain that.

A. Well, the dampness of atmospheres will cause cor- 1267
rosion on any metal.

X-Q. 57. Is that your explanation of it?

A. Yes.

X-Q. 58. And how about the grit; how does it get under there that you spoke about?

A. Well, I haven't answered that question; I don't really know how to put that, only that water will penetrate almost anywere.

X-Q. 59. How long has it been since you took off any of these internal two-wire tires?

A. Why, it's regular occurrence, pretty nearly every 1268
month, that something wants renewing, reset, so on, etc.

X-Q. 60. That doesn't answer the question. I asked you how long it had been since you took off one of the tires?

A. On the 4th of September last.

X-Q. 61. Do you know what kind of a tire it was?

A. Cap tire; internal two-wire tire.

X-Q. 62. I meant what make of tire?

A. Put on by the Firestone.

X-Q. 63. Was it loose or tight in the channel?

A. That tire was tight.

X-Q. 64. Had it been reset? 1269

A. No.

X-Q. 65. It had worn out, had it, without ever having had anything done to it?

A. No. It was an old cab that I had had standing, and was out of service. The tire was new, worn some; took it off and replaced it on another cab which was in service.

X-Q. 66. If one of your cabs were passing along the paved street which is immediately below here, and if coming against an obstruction, or otherwise, both wires

1270 should break, what would you say had happened to the tire?

A. A defect in the wire.

X-Q. 67. What would happen to it; would it stay on the wheel or would it come off?

A. It all depends on it; if the tire was perfectly tight it may stay there for a little while; the cementing of the two ends may have that much strength to remain there for a little while, not long.

X-Q. 68. Did you ever have two wires break in a tire?

A. Yes.

1271 X-Q. 69. What caused them to break?

A. Well, I don't think anybody can just exactly tell the cause of it. It may have been a flaw in the steel wire, about the only cause I can find for it.

X-Q. 70. But they break sometimes after they have been used quite a little while, do they not?

A. They sometimes break when they are putting them on, even.

X-Q. 71. Well, answer the other question first.

A. Sure, yes.

X-Q. 72. Have you had the same number of rigs,

1272 that is, about twenty-five, during the last ten or twelve years?

A. Yes.

X-Q. 73. What kind of rigs are they; give the different styles and the number of each?

A. Imperial, opera bus, one each, two victorias, three or four cabs; the rest of them has been turned in and got new ones. I had four cabs, I had four broughams, demi-coach, three landaus, and other light rigs, buggies.

X-Q. 74. You gave the price of a carriage tire of

being from $10 to $12 a tire. What size tire, inch and three-quarters? 1273

A. Yes, inch and three-quarters, something like that. Cab tire is two and a quarter, two and a half, I think it is $18 I said.

X-Q. 75. You don't know what price per pound you pay for these tires, do you?

A. Seventy or seventy-five cents, somewhere around there.

X-Q. 76. One of the gentlemen who testified here said that he paid 45 cents for second quality, and 55 for first quality. You paid more than that, did you?

A. I never got off easy price as that. I paid 70 and 75. 1274

X-Q. 77. Well have you any idea what these tires weigh, the inch and three-quarter and the two and a half?

A. No, I don't.

JACOB HANSEN.

Thereupon defendant called as a witness, in defendant's behalf, MR. EDGAR W. SAMUELS, who, being first duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield: 1275

Q. 1. Please state your name, age, residence and occupation.

A. Edgar W. Samuels; 27; 15 North Paulina; vehicle tire-setter.

Q. 2. Are you proprietor of that business, and if so, where do you carry it on?

A. Yes, 337 Randolph street.

Q. 3. How long have you been engaged in that business?

A. Do you mean down there?

1276 Q. 4. In the city.

A. Four years.

Q. 5. During the last four years have you put on and taken off carriage wheels solid rubber tires having two internal wires like the tire of the Grant patent in suit, which I now show you; you recognize that, do you?

A. Yes.

Q. 6. Has the putting on and taking off of these tires for the last four years been your entire business?

A. Yes.

Q. 7. As near as you can state, how many of such tires have you put on and taken off of wheels of various
1277 vehicles during the last four years?

A. About 10,000.

Q. 8. How do you put such tires on the wheel?

A. With two wires.

Q. 9. I mean, by hand?

A. By machine.

Q. 10. In applying these two internal wire tires to the wheel by machine, how tight do you strain them the two wires, in clamping the tire in place?

A. Pull them as tight as you can in order not to break.

1278 Q. 11. Do you stretch both wires with equal tightness?

A. Yes, sir.

Q. 12. In putting on these 10,000 tires by these two internal wires by machine, as you have stated, to your knowledge, or have you ever heard of an instance, or have you ever heard anybody claim that the base of these tires below the two wires and contacting with the metallic channel or rim, or the two wires themselves, ever rose or fell or the tire tilted in the channel, or the wires tilted or tipped under any strain or use that the wheel was put to, even of the severest character over and

among the car tracks or on the worst streets of this city, in use? 1279

Question objected to as immaterial and incompetent, for reasons stated in objecting to similar questions in previous depositions, particularly to Q. 12 in Knight's deposition.

A. No.

Q. 13. After a tire has been clamped in place by the two internal wires, strained by the machine as you have testified, in your opinion is it possible to tilt and tip either wire up or down or lift and reseat the base of the tire in the channel by any kind of a force applied sidewise to the exposed portion of the rubber tire above the channel? 1280

Question objected to as incompetent, the witness not having qualified as an expert or shown any particular means, knowledge or experience that would qualify him to give an opinion of this kind.

A. No.

Q. 14. How have the tires that you have applied, or the tires that you have taken off of the wheels returned to your shop been, worn out or destroyed; I mean, what was their condition that necessitated your taking off of the tires? 1281

Objected to as incompetent and immaterial, for the reasons heretofore stated, and this objection is repeated to all questions relating or asking for opinions and conclusions of the witness, or concerning devices not produced.

A. Why, some of them were, the wires had been cut through, and some of them were chipped out, and others they needed new tires, and nine out of ten were stuck to the channel.

Q. 15. How do you mean were these old tires stuck to the channel; what stuck the tires to the channel after

1282 the two wires had been cut and the tire itself separated?

A. The rust.

Q. 16. What force would be necessary to be used to separate or tear these rusted in tires at their base from the channel; I mean, would you have to do it by a machine, or pull the tires apart from the channels by the hand?

Question objected to as wholly improper and suggestive.

A. By hand.

Q. 17. Have you ever noticed whether or not in tear
1283 ing the base of these rusted in tires from the channel that any portion of the canvas or the rubber base would stick to the channel in pulling them off; state the fact?

Last objection repeated.

A. Yes, sir, I would.

Q. 18. As I understand you, you do not either build carriages, or keep a livery, but your sole business is running a shop or plant for applying these two internal wire rubber tires and taking them off; is this correct?

A. Yes, sir.

Q. 19. What are the principal vehicles or sizes of these solid rubber tires that you are called upon to put on and
1284 take off in your business?

A. From seven-eighths to inch and three-quarters. Buggies and coaches.

Q. 20. Is any considerable portion of your business in putting on and taking off of these tires from the ordinary private rigs used by the individual citizen?

A. Yes.

Cross-Examination by Mr. Staley.

X-Q. 21. What make or makes of tire do you use principally in your business?

A. Internal wire.

X-Q. 22. What makes? 1285

A. Diamond, Morgan & Wright and Dryden.

X-Q. 23. By whom and when were you asked to testify in this case?

A. Mr. Harmer. This morning.

X-Q. 24. By Mr. Harmer, you mean the gentleman who was sitting here a few moments ago?

A. Yes.

X-Q. 25. Which of the three tires mentioned by you do you use the most of?

A. Diamond.

X-Q. 26. Do you do any work for livery stables?

A. Yes, sir. 1286

X-Q. 27. What livery stables?

A. Nathan Foote and W. C. Long.

X-Q. 28. Do you take off the tires for them?

A. I don't for Long; he takes his own tires off. Foote does, too.

X-Q. 29. What prices do you pay per pound for the rubber you use in these tires?

A. Fifty-five cents.

X-Q. 30. Has that been the only price that you have paid for the two different makes in the last four years?

A. That was for the best grade, but there is cheaper 1287 grades.

X-Q. 31. Well, my question is, what have you paid in the last four years for the different kinds?

A. I have paid from 30 to 60 cents.

X-Q. 32. Did you ever have many tires come to you to be reset because the tire was loose, and before it had worn much in the base or cut?

A. Yes, sir.

X-Q. 33. You know what made it get loose?

A. Well nine out of ten one wire broke.

1288 X-Q. 34. Did you ever have them where neither wire was broken?

A. No, sir.

X-Q. 35. You never had any instances where the tire was loose and would creep around the channel with neither wire broken?

A. No, sir.

X-Q. 36. Where the wires which you spoke of being broken, did it sometimes happen after the tires were in use for some time?

A. Yes, sir.

X-Q. 37. Do you know what made it break?

1289 A. Where it was brazed the wire might have been burned or there might have been a flaw in the wire some place.

X-Q. 38. You say it might have been. Do I understand from that that you do not know?

A. I have had wires that have had flaws.

X-Q. 39. Do you mean to say that that is what causes the wires to break in all cases?

A. In my experience.

X-Q. 40. That being the case, why doesn't it break as soon as it goes into use?

1290 A. I don't know.

X-Q. 41. Is it not a fact that these wires are broken by the tire being forced over sidewise on the streets, or in turning or against a street car track, or something of that kind, which brings the side strain on one wire only?

A. No.

X-Q. 42. You know that, do you?

A. Yes.

X-Q. 43. How do you know it?

A. By my experience.

X-Q. 44. Did you ever personally see one of these wires break in use on the street?

A. No.

X-Q. 45. So you don't know what strain was put on it just at the time it was broken, not having seen it, do you? 1291

A. No.

X-Q. 46. And yet you attempt to instruct the United States Court, who is going to try this case, that the wire did not break under the side strain, although you never saw one break and don't know what broke it; is that right?

A. Yes, sir.

X-Q. 47. You also gave it as your opinion that it was impossible for one of these tires properly applied to rise in the channel, or tilt in the channel, or the tire to raise away from the channel under any kind of a strain applied to the top of the tire; now explain to the court why this is impossible. 1292

A. If it is applied there is no possible chance for it to rise and fall.

X-Q. 48. That is the opinion you expressed before, but now I want to know why it can't rise; explain to the court the reasons why it can't possibly rise or tilt.

A. Because the wires holds it firmly to the base of the tire.

X-Q. 49. You mean that the wires clamped down on the rubber, which is between the wires and the channel, that causes the bottom of the rubber to be held so firmly against the channel that the friction between the two parts will not permit them to move; is that the idea? 1293

A. Yes, sir.

X-Q. 50. What make of a machine do you use for putting on these tires?

A. Morgan & Wright upright.

X-Q. 51. You slip the rubber tire, or a portion of it, in the channel after the wires are made as tight as pos-

1294 sible to close up the space where the wires were united together, do you not?

A. I do.

X-Q. 52. There is nothing at any part of this channel which forms any rigid attachment between the tire and the channel which will prevent it from slipping if the proper force is applied to it, is there?

A. No.

X-Q. 53. Well, did you know that no matter how tightly you can fasten these wires that that portion of the rubber which lies between the wires and the channel is always elastic and can yield?

1295 A. No.

X-Q. 54. Here is a tire which a Diamond rubber man testified was put on as tight as he could, and yet by simply putting a screw-driver under it, as I do here, and moving it you can raise the base of the rubber, and also move the wire; did you know that?

Defendant's counsel objects, as he has before, to this attempt to confuse the witness and mislead the witness; that the witness has testified that this tire base and the wires cannot be lifted and tilted from the base of the channel by any strain in travel that

1296 is put upon the exposed portion of the rubber of the tire, and that it is perfectly evident that you can not only lift this tire and wire by inserting a screw-driver or a cold-chisel under their base, but that you can lift any object, even this seventeen-story building, by getting under it and with sufficient leverage prying it up, and defendant's counsel protests against this effort to mislead the witness and confuse the testimony as to any relevant fact testified to by this witness.

By Mr. Staley: Foregoing statement is objected to as wholly improper for obvious reasons, its

purpose being evident. The attention of the court is called to the fact that after this witness gave his opinion that he did not know that the base portion of the tire, or that portion between the wires and the channel was elastic or would yield after the wires had been drawn tightly. 1297

A. Yes, sir, I know that.

X-Q. 55. What permits this wire to move?

A. Where it sinks to the rubber as he puts the screw-driver under it.

X-Q. 56. That is, it's the elasticity of the rubber between the wire and the channel, is it not?

A. Yes, sir. 1298

X-Q. 57. So that it is not impossible for this wire or rubber to yield or raise away from channel, provided the proper force is applied to it in the proper manner; is that right?

A. Yes.

X-Q. 58. Suppose, now, that this wire or rubber did actually raise up and move away from the channel or tilt, and that the wire moved with it, due to a side strain, by running against a street car track or otherwise, would it be possible for you to know whether it did or not?

A. No. 1299

X-Q. 59. Mr. Pond, a gentleman who claims to be an expert, and who testified as an expert in this case, introduces this drawing which I now hold in my hand, and in Fig. 6, right there, he illustrated what he said would take place in one of these tires when it was forced sidewise against a street car track, and he said also that that side strain there would draw heavily on the wire on the left-hand side and in many cases cause it to break; is that your idea also?

Question objected to as incompetent and not proper cross-examination.

1300 A. That's providing if the wheel should go in a slot, or if the wheel didn't track it would break that way.

X-Q. 60. That is, the side strain on the tire caused by coming against solidly a stationary obstacle, like a street car track, would have a tendency to force the wire over and draw on that wire on the left-hand side so as to cause it to break; is that your idea?

A. Yes.

X-Q. 61. Is it not also true that if this side strain continued after the wire broke that it would cause this tire to roll over towards the other side and bring the strain on the other wire, and might cause the rubber to tear out or
1301 the other wire to break and roll clear out of the channel; is that true?

A. That is not true.

X-Q. 62. If Mr. Pond, the defendant's expert, testified to that you don't agree with him, do you?

A. No, sir.

X-Q. 64. Now, what is your idea that would take place after that wire broke and the strain still continued to push over on this tire, heavily loaded, as indicated in Fig. 6?

A. If one wire would hold and it was run very long,
1302 it would cut through.

X-Q. 65. And after it cut through and it got a similar hard side strain, would it then tip over to one side, and if the second wire broke tip out of the channel?

A. Yes.

X-Q. 66. How many vehicles do you own and operate yourself that have these internal two-wire tires on?

A. How many do I own and run myself?

X-Q. 67. Yes.

A. I don't own any.

X-Q. 68. Where do you buy your channel iron and wires that you use for putting on these tires?

A. I have nothing to do with the channels, the black- 1303
smith buys them and puts them on himself.

X-Q. 69. Well, how do you do about this when a man comes to have a tire applied, do you hire a blacksmith to put on the channel iron?

A. I take the wheel up to the blacksmith, which is about a half a block away, and he fits the channel.

X-Q. 70. Well, who pays the blacksmith?

A. I do.

X-Q. 71. And how about the wires?

A. The wires I buy from Morgan & Wright.

X-Q. 72. And you can use the same wires and the 1304
same channel for the Diamond rubber, can you?

A. Yes, sir.

X-Q. 73. I think you said a good many of these tires that you took off were cut out before they were worn out; did you say what proportion, if not, do so?

A. Why cut out, that's chipped out; about half.

X-Q. 74. By chipped out you mean they are chipped out at the top and sides?

A. Yes.

X-Q. 75. Then, you did not mean that they were cut out at the base by the wires creeping or traveling, or some other action of that kind? 1305

A. No.

X-Q. 76. What proportion of the tires that you take off are cut out at the base in that manner?

A. Why, one-sixteenth of an inch.

X-Q. 77. You don't quite understand; I mean by proportion, how many tires out of ten or 100, for instance?

A. About one-third.

X-Q. 78. And when they were cut like this and you come to cut the wires, were the tires then tight in the channel?

A. Nine out of ten would be.

1306 X-Q. 79. Notwithstanding that the wires are cut through the rubber or worn through the bottom; is that right?

A. Yes.

EDGAR W. SAMUELS.

Recess.

Thereupon defendant called as a witness, in defendant's behalf, Mr. ERNEST R. WICKSTROM, who, being first duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield:

1307 Q. 1. Please state your name, age, residence and occupation.

A. Ernest R. Wickstrom; 45; 1600 Honore street; carriage maker and manufacturer.

Q. 2. Have you ever had any experience in the taking off and putting on of two internal wire solid rubber tires like the tire shown in the patent in suit that I now hand you?

A. Yes, sir.

Q. 3. How long have you been putting on and taking off such tires in this city?

1308 A. Three years.

Q. 4. At what place, where is your shop?

A. 282-84 East 63rd.

Q. 5. Do you own and conduct the business yourself?

A. I practically run the business, but I have a partner.

Q. 6. Do you personally attend to putting on and taking off the solid rubber tires?

A. Not always; in the first place I did, but of late I have not done the most of it.

Q. 7. During the last three years how many of these

solid rubber tires have you put on, and how many taken off; give your best estimate? 1309

A. About twenty-five sets a year, and reset 250.

Q. 8. How do you put these solid rubber tires on the wheel rim?

A. Why, by a machine.

Q. 8*a*. How tight do you pull the wires in fastening the tire upon the rim with the machine?

A. Why, we have no way of telling the exact pressure on the wire, we use our judgment and run the machine as tight as the wire will stand to allow us to close the opening on the tire, which is necessary to braze the wires. 1310

Q. 9. You mean you run the machine as tight as the wire will stand without breaking or cutting the rubber?

A. No, tight enough so that the tire will remain in the channel. I don't hardly know how to answer that correctly, I don't know how to express myself.

Q. 10. Do you know whether or not you stretch the wires so tightly that they hold the base of the tire down into the channel rim so that it cannot move or be made to rise or fall or tip or tilt, no matter what strain is put upon the wheel and tire in the most severe usage in travel that you can put the tire to in this city? 1311

Objected to as purely incompetent and immaterial, and also as calling for information that is clearly beyond the witness to know, unless he shows special tests or other means of knowledge which entitles him to express expert opinions, which he has not shown; also, as immaterial as to what he may claim to know about it.

A. If the wire is put in right the rubber in a severe test will tear before it will get it out of the channel or tilt.

1312 Answer objected to as incompetent, for the reasons stated.

Q. 11. When you take off these old tires, or have taken the 250 tires off, as you have described, in the last two or three years, in what conditions do you find the tires as to being worn out or cut or destroyed before wearing out?

Question objected to as incompetent, as calling for opinions and conclusions, and also for testimony concerning devices not produced; also as immaterial.

A. Find them in all conditions.

1313 Q. 12. Well, what would be your best judgment as to the tires that are cut or destroyed by the wires or pulling through the wires before they were worn out by wear on the surface tread of the tire, as to numbers?

Last objection repeated, and further objected to as leading.

A. They are mostly all cut and torn and damaged, more damaged than they are worn out.

Q. 13. When you want to take one of these old tires off of the wheel, what do you do with the wires before trying to take the tire off?

A. Cut them off with a cold-chisel.

1314 Q. 14. At the joint where the two ends of the tire meet?

A. Mostly always.

Q. 15. When you cut these two wires at the joint in the old tires that you take off, do the tires fall off of the wheels themselves, or what do you have to do, if anything, with the tires to get them off of the wheels?

Objected to as immaterial, and also as leading.

A. Most of the time they are loose and fall off, but sometimes they stick to the channel and have to be pulled loose.

Q. 16. What causes the tires to stick to the channel so that they have to be pulled apart? 1315

Objected to as incompetent and calling for conclusions about devices not present.

A. Rust accumulates.

Cross-Examination by Mr. Staley.

X-Q. 17. When, and by whom, were you asked to testify in this case?

A. I was asked this morning, on the telephone, by Mr. Harmer, of the Diamond Rubber Company.

X-Q. 18. You say that you have reset about 250 of these tires; why were these reset? 1316

A. Some wires were broke, and part of the tires were worn out, and we put new pieces.

X-Q. 19. Did you ever reset any because the wires or tires had become loose, without the wires breaking?

A. Yes, sir.

X-Q. 20. What particular makes of these internal wire rubber tires have you used during the past three years?

A. We have used Goodyear, Pennsylvania, India Rubber Tire Company, also Hartford.

X-Q. 21. Who furnished the machine that you use to put them on?

A. I bought it from Goodyear. 1317

X-Q. 22. What is known as the Goodyear machine?

A. Yes, sir.

X-Q. 23. Do you use the same machine for any make of tires that you have mentioned?

A. Yes, sir.

X-Q. 24. Where do you buy your channel and wire?

A. Channel from Kelly, Maus & Company, and the wire from India Rubber Company.

X-Q. 25. Kelly, Maus & Company are dealers in carriage supplies and material in this city?

A. Yes, sir.

1318 X-Q. 26. And do you use the same channel and the same wires for putting on any of the different makes of rubber that you mentioned?

A. Yes, sir.

X-Q. 27. You spoke about the tires being drawn together to close the opening necessary to braze the wires, do you mean that when you are brazing the wires you have to leave a space between the ends of the rubber, and that afterwards the ends of the rubber are brought together by moving a part of the tire in the channel after the wires have been tightened and brazed?

A. Yes, sir.

1319 X-Q. 28. Do you use a machine for this purpose?

A. Yes, sir.

X-Q. 29. What kind of a machine?

A. It's a part that goes with the Goodyear tire machine called the closer.

X-Q. 30. How does it work?

A. The wheel is put on a spindle and a lever with the clamp catches the tire, and by tightening the clamp and pulling on the lever will force the opening closed, or force the rubber closed.

X-Q. 31. You mean that you tighten the clamp on the
1320 rubber and then by pulling on the lever it draws the clamp around and that draws the rubber along in the channel until the two ends of the rubber are brought together?

A. Yes, sir.

X-Q. 32. How far is this clamp placed from the end of the rubber, and about how much or what length of the rubber is included in the clamp; how far does it come around on the wheel from the end of the rubber?

A. About 30 inches.

X-Q. 33. And would that also draw the rubber to some extent from the part beyond the clamp?

A. No, it can't because there is another clamp below this. 1321

X-Q. 34. That is, that in putting the tire on and before the wires are brazed together you put a clamp on the wheel felly and around the tire, which clamps the tire very tightly in the channel at that point, and then you put what is called the "compression" of the rubber, by stripping the rubber back on the wires to the point where this clamp is on the wheel, then afterwards you draw the rubber together, moving that part of it which is between the fixed clamp and the end of the rubber; is that right?

A. Yes, sir.

X-Q. 35. And if this fixed or stationary clamp was not there, I suppose it would have a tendency in pulling the end of the rubber to close the joint, to draw the rubber from a point beyond where the movable clamp is attached, would it not? 1322

A. Yes.

ERNEST R. WICKSTROM.

Defendant's counsel calls the attention of complainants' counsel to Volume 1 of the printed record in the U. S. Court of Appeals for the Seventh Circuit in the case of these complainants *et al.* against the Kokomo Rubber Company, and asks complainants' counsel if he will furnish the court, or see if the court is furnished, Volume 2 of this printed record, as defendant's counsel has been unable to find or procure Volume 2, either from the court or the clerk of the court in which the case was pending, or from the counsel for defendant in said case, or appellee. 1323

Complainants' counsel replies that he has already stated that he does not know where such record is; further calls attention to the fact that defendant's counsel has repeatedly claimed that he had this record

1324 in New York, and if that is true, there is no reason why he shouldn't produce it.

Defendant's counsel says that he has never intended to state that he had the second Volume of this record; that the first volume of the record was the volume referred to, and was the only part of the record obtainable upon the hearing of the injunction motion; that defendant's counsel have made every investigation and search that he believes available to obtain this second volume, without success; that it appears by the printed copy referred to that the examining counsel here, Mr. Paul A. Staley, was
1325 the leading counsel for the complainants in that case, and that, of course, he must necessarily have, or can obtain this second volume; that the request is made in the spirit of the opinion of the Court of Appeals in this case in passing upon the injunction motion, and that if complainants' counsel do not furnish the second volume of the Kokomo case in this case it will be contended that the act in so doing is intentional and intended to prevent the presence of Volume 2 of said record in the trial of this case.

By Mr. Staley: Complainants' counsel states
1326 that while his name appears on the record, that he was not chief counsel in that case, but that Mr. Frederick P. Fish was senior counsel. He further states that he personally had little or nothing to do with the preparing of the record for the Court of Appeals, or the taking of the appeal; that this work was done almost solely by Mr. Bowman and the counsel of Mr. Fish. Complainants' counsel further states that he is under the impression that Mr. Holloway, clerk of the Court of Appeals, across the street from here, told him that he had an extra copy of Volume 2 of this record. He is not positive that

it was Volume 2, but Mr. Holloway told him that he had an extra copy of one of the volumes. He further states that he will gladly do what he can to bring this record to the court of this case, if it is a fact that defendant's counsel cannot secure a copy, but at the present time he has no knowledge of where such copy is to be found, if it is not to be found in the Court of Appeals. 1327

Thereupon defendant calls as a witness, in defendant's behalf, MR. CHARLES H. KNIGHT, who, being first duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield: 1328

Q. 1. Please state your name, age, residence and occupation.

A. Charles H. Knight; 43; Chicago, Oak Park; rubber tire business is the only occupation.

Q. 2. In what way or manner are you in the rubber tire business?

A. What capacity, do you mean?

Q. 3. Yes.

A. As president and general manager of the Chicago Rubber Tire Company.

Q. 4. Where is that company located as to its place of business, and what are your duties as general manager? 1329

A. 425 Wabash avenue; duties are a general supervision of the interests of the company, in all its departments, including actual work in the shop in the applying of both solid and pneumatic tires of any and all descriptions.

Q. 5. How long have you been familiar personally with the solid rubber tire used upon vehicles in this country?

1330 Question objected to as immaterial, unless the witness states in what way or capacity he has been familiar with it.

A. How long have I been familiar with it? About thirteen years.

Q. 6. Please look at the tire, solid rubber, with two internal wires shown and illustrated in the Grant patent in suit, and state for how long a time you have been familiar with that tire in use upon various vehicles in this country.

Last objection repeated.

A. About ten years.

1331 Q. 7. How long have you been president or connected with the Chicago Rubber Tire Company?

A. Since its organization, about four years ago.

Q. 8. Has that company put on and taken off tires like the Grant patent in suit since its organization, four years ago?

A. It has.

Q. 9. What was your connection, if any, or knowledge of these two internal wire solid rubber tires prior to four years ago?

A. That meaning my experience with the same, of

1332 course?

Q. 10. Yes.

A. Selling, applying and demonstrating the application of tires, both in Chicago and in about twenty-seven states on the road.

Q. 11. How many of these solid rubber tires with two internal wires, approximately, has your company either taken off or put on wheels of various vehicles in this city since its organization, four years ago?

A. Estimated 2,000 to 3,000 tires.

Q. 12. Prior to four years ago, can you state approximately how many tires you had become familiar with,

solid rubber with two internal wires, either by selling or applying or having knowledge of from the time you first became acquainted with such tire some ten years ago? 1333

Objected to as immaterial.

A. That would be a hard question to answer as to how many.

Q. 13. Well, approximately; give your best estimation.

A. That might include all the tires that I had seen or handled.

Q. 14. Well, please include them and answer.

Last objection repeated. 1334

A. Answer that question?

Q. 15. Yes.

A. In what way do you want me to answer that question, as to about the number of tires that I had come in contact with or seen manufactured or sold?

Q. 16. Yes, of these solid two internal wire tires.

Same objection.

A. Well, I should say probably a million tires or more.

Q. 17. In these tires put on by your company of which you are president, and such solid rubber tires like the tires of the Grant patent that you personally applied or directed applied to wheels of various vehicles, how were those tires applied, as to mechanical means, to the different wheels; I mean, by hand manipulation or mechanical devices? 1335

A. We applied them with two internal wires, using nearly every kind of a rubber tire machine that has ever been manufactured in this country.

Q. 18. How were these solid two-wire tires locked or fastened in position upon the wheel rim by all of these machines?

1336 A. First by twisting the wires and springing the rubber over the channel, without the aid of a machine, and second, by electrically welding the wires when a low carbon wire was used in connection with the same, and, third, by a method commonly known as brazing the wires together and using a higher carbon wire than the No. 2 process of electric welding.

Q. 19. Was this method of twisting the ends of the two internal wires together and thus fastening them and then jumping the tire onto the rim used prior to or since the custom of electric welding or b[illegible]ing came in?

1337 Question objected to, as the witness has not shown any means of knowledge as to the question referred to, and his conclusions or opinion thereon are incompetent.

A. Prior to all other methods of fastening.

Q. 20. In your practice, personally, and of your company, how tight or taut was these two clamping wires drawn before being brazed and to fasten the tire into position in the rim?

Objected to as immaterial.

A. That would depend upon the quality of the rubber that we were using on each particular job.

1338 Q. 21. Well, assuming that the best rubber was used, how tight would the wires be drawn?

A. It would be hard to give the exact tension put on each and every wire, but our policy has always been to apply them as tight as we figured they should be to get the best results, and at the same time not injure the holes in the rubber by drawing the wires too tight.

Q. 22. Well, how tight have you drawn them with these machines, having in view the breaking point or strain of the wire?

Objected to on the ground that the question has

already been answered in the best judgment of the witness. 1339

A. Well, I might say that we have at times drawn them so tight that we have broke the wires by putting too much strain on them, the proper tension only being known or obtained by the actual and practical experience in the application of the same.

Q. 23. Well, how tight did you draw these wires while they were in the machine, having in view any movement whatever of the wires after being clamped in place or the rubber and canvas under the wire under the severest conditions of travel?

Question objected to as incompetent and immaterial, and as leading, and as an attempt to change the answers of the witness already made, as to the tightening of the wires concerning which the witness has already testified. 1340

A. It has always been our policy to apply the tires so tight and rigid in the channel that we figured it to be an impossibility for them to move in any direction whatever from the base of the channel.

Answer objected to as incompetent, as stating mere conclusions and opinions; also as immaterial.

Q. 24. Mr. Knight, during the eight or ten years that you have been familiar with applying and fastening of these two internal wire solid rubber tires to the wheel rims, by the mechanical appliances used by you, have you ever known yourself, or have you ever heard that there then existed in the tire or in the wire any capacity to rise or fall or lift or tilt in the channel from the base contact by any strain or any of the severe movements that a wheel was subjected to in or among the car tracks of the city or upon any road testing to its fullest capacity the qualities of the tire? 1341

1342 Question objected to as incompetent and immaterial for reasons heretofore stated in objections to similar questions in previous depositions.

A. Not when properly applied, and the right carbon wire being used.

Q. 25. Have you, during the week past, at my request, made any experiment to prove to yourself and to absolutely demonstrate to the court that a solid rubber two internal wire tire locked in position in the rim, by straining the two wires to the extent and in the manner you have described, will not lift from its base and the wires will not tilt nor adjust themselves under any strain
1343 of travel to which the wheel may be subjected over and among and about the car tracks and most severe usage possible in this city?

Objected to as clearly incompetent, and also as leading.

A. Yes, I have made such a demonstration, which substantiates my previous belief and knowledge by this particular tire being still held rigid in the channel after a week's service over all kinds of streets in this city, and by marking the tire the fact is established to me beyond a doubt that the tire did not move in any respect what-
1344 ever from the base of the channel, or otherwise.

Answer is objected to as purely incompetent because it refers to devices not in evidence.

Q. 26. Please describe specifically this demonstration upon your part; what you did to make it absolutely certain that neither the base contact of the rubber tire, nor the clamping wires lifted or tilted in the service of the wheel under severe conditions of travel in this city.

Last objection repeated, and also as leading.

A. We applied a heavy coating of cement in the base of the channel; also marking the position of the tire at the time of applying same; and the cement and the pri-

vate mark that was placed on same prove to me that the wires had not moved from their original position. 1345

Answer objected to as incompetent and immaterial.

Q. 27. What strain or tension did you give to the two retaining wires on this demonstrating wheel in comparison with your usual application of the wires on the tires?

Last objection repeated, and as calling clearly for a conclusion.

A. We simply applied it in the usual way, putting no more strain on the wires of this particular wheel than we do on any and all others.

Q. 28. How do you know that this wheel was subjected to the usual and unusual conditions of travel in the streets of this city, car tracks and otherwise? 1346

Last objection repeated, and by consent the objection is made once and for all as to all questions and answers to the alleged experiment and demonstration.

A. I had the demonstration made by my own horse and wagon, and by my own men, who I personally saw driving same over the streets of the city for about one week.

Q. 29. Did you do anything with that wheel to ascertain whether your experience and opinion as to the fixed character of location of the base of these solid rubber tires and the clamping wires under all conditions of travel since you took the wheel off of the vehicle? 1347

A. I personally cut the two internal retaining wires, examining the tire and found that it was still retained in its original position, being obliged to break the cement in removing same.

Q. 30. When did you take this demonstrating wheel from the vehicle and cut the wires?

A. On the 10th day of January, that's to-day.

1348 Q. 31. Did you use a new or an old channel upon this demonstrating wheel?

A. I used an old channel.

Q. 32. Had the rubber tire been used before?

A. It was a new rubber, never having been applied before.

Q. 33. Have you that wheel with you?

A. Yes, sir.

Q. 34. Is this it?

A. This is the wheel in question.

1349 Defendant's counsel here offers in evidence the wheel identified by the witness, and requests that the same be marked "Defendant's Exhibit Cement Demonstrating Wheel."

The said exhibit is objected to as incompetent and immaterial.

Q. 35. I call your attention to the fact that I have directed at a point about opposite the wire on portion of the tire that the tire be tied by a cord to the wheel, so that it cannot be further separated by hand or unseated from the cemented rim. Do you recognize this fact?

A. I do.

1350 Q. 36. I will ask you as to something over a third of the rim, or of the tire, torn loose from the rim, whether or not you have removed or torn apart from the rim this much of the rubber tire, so as to absolutely assure yourself that the tire was cemented to the rim?

Objected to as incompetent and leading.

A. I have.

Q. 37. Please, now, state to the court whether when you first cut this tire to-day and the wires, that portion of the tire which is now stripped from its base was then held firm and solid by the cement to the wheel.

Last objection repeated.

A. The cutting of the wires would naturally allow the 1351
tire to break the cement and separate from the channel, the cement being applied merely to show that the tire after being held by the wires, and the same being cut, the cement would, of course, not hold the rubber in position, but would serve to demonstrate that the rubber had not raised or moved in the channel.

Q. 38. I mean, when you first cut the wires, did there anything more of the rubber tire tear loose from the cement at that time than a few inches upon each side of the severed portion of the tire?

Objected to as leading and as already answered.

A. I broke the rubber away from the cement for about 1352
three feet, not deeming it necessary to remove the entire rubber.

Q. 39. How long has this wheel constituting this exhibit been used by you?

A. The wheel?

Q. 40. Yes, the wheel.

A. Do you mean the wheel itself?

Q. 41. Yes, I mean the wheel and the channel itself.

A. About four or five years.

Q. 42. I notice that this channel rim is worn to a comparatively sharp edge upon the outside; how did this 1353
happen, and is this common in the wear of channel rims?

Objected to as immaterial.

A. This is the universal condition of a steel channel after having been run in the car tracks of the cities for a period of one year or more.

Q. 43. In these many thousands of solid rubber tires that you have been familiar with upon various wheeled vehicles for the last eight years, will you state as closely approximate as possible what proportion of the tires are worn out upon their tread by use in comparison with the

1354 tires that are otherwise destroyed before being worn out; simply give your best estimate as to percentage?

Objected to as incompetent and immaterial, and for reasons heretofore stated in objections to similar questions in previous depositions.

A. Now, supposing you say; with reference to the different grades of rubber, it has been my experience that the tire commonly known as No. 1, or first grade of rubber, that approximately 90 per cent. of the same would wear down to the channel; on cheaper grades of rubber, however, I find that the larger majority of same will cut out at the sides or through the bottom of the
1355 wire holes instead of wearing down to the channel, as in the case of first grade rubber.

Q. 44. In taking off these old tires by the cutting of the wires at the joint and the severing of the rubber, what has been your observation and experience as to these old tires and wires separating at their base from the channel or adhering at their base to the channel for any reason?

Objected to as leading and immaterial, and calling for conclusions as to devices not produced.

A. My experience has been that about 90 per cent.
1356 of said tires have never moved from their original positions in the channel, and about 10 per cent. of same have moved; wait a moment, simply on account of a too low carbon wire being used and the application of same not being done by a practical man, which has allowed about this percentage of the tires to become loose and travel around in the channel.

Answer objected to as stating conclusions.

Q. 45. Do you mean that in 90 per cent. of these old tires so removed there is an adhesion more or less by rust or corrosion between the canvas and rubber base of the tire to the rim channel?

Objection to last question repeated, and also objected to as leading. 1357

A. That is precisely what I mean.

Cross-Examination by Mr. Staley.

X-Q. 46. I noticed in this wheel when you brought it in, when it was first brought into the room, that a portion of the tire, that is the rubber, stood from a half to three-quarters of an inch from the bottom of the channel, and that the cement or whatever you used, was stretched out in threadlike particles and was still connecting the rubber to the channel, but at that distance removed, while at the present time those threadlike portions seem to have been broken off by handling the tire. Did this cement, or has this cement rubber in it as a part of its compound? 1358

A. Not having analyzed the cement in question, I could not say whether it contains rubber or not.

X-Q. 47. Well, you do know, do you not, that when the tire was first drawn away from the channel this cement stretched out in the threadlike particles that I mentioned?

A. Yes, I know that the cement did stretch out in threadlike particles. 1359

X-Q. 48. And do you know also that this tire and channel is still sticky to the touch, and that defendant's counsel in handling it, got quite a little of it on his hands, do you not?

A. I know it is still somewhat sticky, which would indicate that it had served its purpose.

X-Q. 49. And when you press the loose portion of the tire into the channel with a side pressure it will still adhere slightly by reason of this soft condition of the cement?

A. Yes.

1360 X-Q. 50. Is this cement what is known as rubber cement?

A. Commonly known as wood rim cement.

X-Q. 51. Do you mean for cementing pneumatic tires into the wood rims, as vehicle wheels?

A. Yes.

X-Q. 52. Is it not a fact that this cement will in time become quite hard?

A. Yes.

X-Q. 53. During the past five years which you have been actively engaged in business with the Chicago Rubber Tire Company, how many of these tires have you
1361 taken off yourself?

A. Oh, I will say 1,000 or more.

X-Q. 54. Who else besides you does this work at your shop?

A. Two other men employed by our company.

X-Q. 55. What are their names?

A. Fred C. Koenig and John L. Haig.

X-Q. 56. Is the Koenig referred to one of the witnesses who has already testified here for the defendant?

A. I believe he is.

X-Q. 57. What makes of rubber tires have you sold
1362 since you were connected with the Chicago Rubber Tire Company, and what make or makes are you now selling principally?

A. The Goodrich, Stein, Diamond, Morgan & Wright, Indiana Rubber & Insulated Wire, Republic, Consolidated, and Firestone.

X-Q. 58. Which are you using now principally?

A. Principally the Indiana Rubber & Insulated Wire Company.

X-Q. 59. And what others are you using at the present time?

A. All the others mentioned.

X-Q. 60. You mean you carry a stock of each of the others? 1363

A. Yes, not a large stock.

X-Q. 61. What machine, or what make of machine, do you use for putting on your tires?

A. The Nelson & LeMoon standard upright machine, and the Nelson & LeMoon specially constructed machine.

X-Q. 62. Do you use the same machine for putting on all makes of tires?

A. No, not all makes and sizes.

X-Q. 63. Well, I didn't ask about the size, I asked about the makes. 1364

A. Well, I use the same machines for putting on all makes of tires.

X-Q. 64. In answer to Q. 19 you said that the twisting the ends of the two internal wires together was used prior to all other fastenings, as I understand it. Where did you get this information?

A. I meant as applied to internal wire tires; that it has been my observation that such is a fact, although I will not state positively that such is a fact.

X-Q. 65. Well, did you not state positively in your direct examination? 1365

A. No.

X-Q. 66. What did you mean, then, that that was prior to all methods of fastening, in answer to Q. 19?

A. I meant as far as my knowledge goes.

X-Q. 67. Well, as a matter of fact, you don't know whether this was true or not; is that what you mean to say?

A. Yes.

X-Q. 68. Since you have been in business with the Chicago Rubber Tire Company, have you used the method of electric welding?

A. I have not.

1366 X-Q. 69. In testifying to the way you put on these tires, you state that "it has always been our policy to apply the tires so tight and *rigid* in the channel," etc. What did you mean by the word "rigid," did you mean to say that the rubber is drawn so tight that it is rigid, like iron or steel?

A. I mean that the word "rigid" applies to our method of securing the base of the rubber in a rigid manner to the channel of the wheel.

X-Q. 70. But I want to know what you mean by the word "rigid"; there is no rigid fastening in the sense of a device which connects the rubber with the channel,
1367 like a bolt, is there?

A. Rigid, according to my view of it, means securing an article in a tight and substantial manner.

X-Q. 71. And that is the only sense in which you used it here, is it?

A. Yes.

X-Q. 72. Would you call anything that is elastic and would yield like these rubber tires rigid?

A. With reference to steel or iron, yes; but to rubber, no.

X-Q. 73. I don't quite understand what you mean by
1368 steel or iron; my question was as to whether you would call anything elastic like this rubber tire, rigid?

A. The word "rigid" as used by me applies only to the steel wire used in the application of solid tires.

X-Q. 74. You don't mean, then, that these wires are ever drawn so tightly that the rubber which lies between the wire and the channel is rigid and has no capacity to yield, or no elastic capacity, do you?

A. I claim that the rubber has elasticity, but that the wires have none.

X-Q. 75. You spoke of the high carbon wire as having some bearing on this question; what has that got to

do with the question as to whether the rubber will yield or not? 1369

A. I find that a high carbon wire will not stretch and allow the rubber to become loose in the channel, and that a soft wire will, or has the opposite effect.

X-Q. 76. And you state as your opinion, do you, that the wires cannot yield and the tire become loose unless the wire does stretch; is that right?

A. I give it as my opinion that the tire will not become loose if properly applied with the right kind of high carbon wire.

X-Q. 77. But give your opinion as to the question. (Question repeated.) 1370

A. Yes, that is my opinion.

Re-Direct Examination.

R-D. Q. 78. Are you any relation to the Mr. Knight who has already testified in this case?

A. I did not know that there had been a Mr. Knight testifying in the case. No.

R-D. Q. 79. With your familiarity with the putting on and the taking off of these solid rubber internal two-wire tires, and with this trade in the twenty-seven states as you testified, have you any doubt, Mr. Knight, that every liveryman in every principal city of these twenty-seven states, and every party engaged to any extent in the putting on or taking off of tires in those states, would testify exactly as you have relating to the application and use and conditions of removal as to such tires? 1371

Question objected to as wholly improper, incompetent and immaterial, and improper re-direct, the witness having first shown no basis for such testimony, and as being absolutely incompetent in any sense.

A. I don't know that the liverymen or the private

1372 users of solid rubber tires would be in a position to give an intelligent opinion regarding the application of solid rubber tires, but I do believe that the large users of rubber tires, meaning the carriage trade throughout the country, would substantiate and bear me out in my statements.

Re-Cross Examination.

R-X Q. 80. Will you please name the largest users of rubber tires in the City of Chicago?

A. Staver Carriage Company, Studebaker Bros., Racine Carriage & Wagon Company, Chicago Coach &
1373 Carriage Company, The George Siegmund Company, Frank Parmlee Company, Frank E. Scott Transfer Company, C. P. Kimball & Company. I could name several others, but those are the principal.

R-X Q. 81. Would you not rank Kimball & Company before the Parmlee & Company and Chicago Coach & Carriage Company as large users?

A. I would, in a wholesale way.

R-X Q. 82. Why is it, Mr. Knight, that you use these internal wire tires; is it because that the trade demand it, or what?

1374 A. We use internal wire tires principally because the local Chicago trade demand a great many cheap tires, which we find are made in internal wire style.

R-X Q. 83. About how long do the tires which you supply, the internal wire tires, last as an average life?

A. That depends on the quality of the rubber.

R-X Q. 84. Can't you give an average, in your judgment?

A. Being about three different grades of rubber on the market, I should judge that about the average wear of the ordinary size internal wire tire to be about one year.

R-X Q. 85. What would you say would be the aver-

age life of the best or No. 1 grade rubber in these tires, and also you may state your idea or estimate of the average life of the lowest grade of rubber in these tires? 1375

A. The best grade of rubber on a family surrey or buggy I believe will run from two to four years, but the same grade of rubber on cabs or carriages, in my opinion, will not average over one year's service, in city use; and the lowest grade of internal wire tires, I believe, will not average six months' continuous service in any size.

R-X Q. 86. You have known of this Grant patent for a long time, have you not?

A. I have.

R-X Q. 87. You know also that if this patent is sustained that you are and have been infringing it by the use of these tires, do you not? 1376

A. No, I don't know that there is any infringement, or any one liable other than the manufacturer selling us the tires.

R-X Q. 88. Well, would the fact that you are liable as infringers, in case the patent is sustained, prevent you from selling this tire as you have been?

A. We would only continue to sell after being served not to do so, but the manufacturers indemnifying us against liability regarding same. 1377

R-X Q. 89. Do you mean to say that you exact an indemnity from the manufacturers that your sale of these tires shall not render you liable for an infringement?

A. We never have.

R-X Q. 90. Then, you meant that you would continue to sell until you were served with some kind of a notice that you had no right to sell; is that what you mean?

A. Yes.

CHARLES HENRY KNIGHT.

Adjournment taken until Saturday, January 11, 1908, 10 A. M.

1378 Chicago, Illinois, January 11, 1908. Met pursuant to adjournment. Present, same as before.

At 12:10 adjourned to 1:30.

Defendant's counsel states that Mr. Staley is correct, and that there was a printed copy of Volume 2 of the record in the Kokomo case of these complainants against the Kokomo Rubber Company, at Chicago, in the model room of that court in patent causes; that the same was found by the clerk of that court and furnished to be used as an exhibit in this case; and Mr. Staley is thanked upon the record
1379 for the information which led to the production of this volume. Defendant's counsel here offers the same in evidence, and requests that the same be marked "Defendant's Exhibit Second Volume Record Kokomo Case."

Thereupon defendant called, as a witness, in defendant's behalf, MR. ALBERT NOLTING, who, being first duly sworn, testifies as follows, in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and oc-
1380 cupation.

A. Albert Nolting; will be 33; 686 East Ravenswood Park avenue; occupation is blacksmith.

Q. 2. Where are you now presently employed?

A. Frank Parmlee.

Q. 3. Is this the Frank Parmlee & Company, the cabmen of this city?

A. Frank Parmlee & Company, of this city, the transfer company.

Q. 4. How long have you been with Frank Parmlee & Company, and what are your duties in connection with that company?

A. Since last May; putting on rubber tires and gen- 1381
eral work, carriage and coach work.

Q. 5. Are you the head or master blacksmith?

A. Blacksmith finisher.

Q. 6. Have you charge of that department?

A. No, I have not.

Q. 7. Well, are you the man who principally personally takes off and puts on the rubber tires for Parmlee & Company?

A. Yes, sir.

Q. 8. What was your employment before you began working for Parmlee & Company before May last?

A. At Sholgren; I don't know how to spell the name, 1382
it is a queer name.

Q. 9. What was their business?

A. Wagon shop.

Q. 10. Did you put on and take off rubber tires there?

A. No, sir.

Q. 11. How long did you work there?

A. About three months.

Q. 12. Where did you work before that time?

A. At Ketzler's.

Q. 13. What did you do there, what was his business?

1383

A. Wagon shop. I done blacksmith finishing.

Q. 14. Did you take off or put on rubber tires there?

A. Yes.

Q. 15. To shorten the matter up I will ask you when you first put on and took off rubber tires like the two internal solid rubber tire of the Grant patent in suit, which I now show you?

Objected to as immaterial.

A. Well, it must be about—you want to know how long ago it is, do you?

1384 Q. 16. Yes, about.

A. About four years ago.

Q. 17. Who did you first put on and take off these tires for?

Last objection repeated.

A. That's where I started, Eichmann, but I done very little of it there; that's where I started.

Q. 18. Well, where have you done the most putting on and taking off the solid rubber tires like the patent?

A. At Millar's Carriage Works.

Q. 19. Whereabouts in this city?

A. 1937 North Clark street.

1385 Q. 20. Did Mr. Millar do a large or a small business in this line?

Objected to as calling for conclusions.

A. He done a pretty good business; a big business in rubber tire business.

Q. 21. Mr. Nolting, since four years ago how many of these two internal wire solid rubber tires have you put on or taken off of wheels of various kinds in this city; I don't ask for exact numbers, but give your best estimation, covering the whole four years?

Objected to as immaterial.

1386 A. About 3,000 or 4,000.

Q. 22. How did you put these tires on these wheels, that is, what means did you use for putting them on?

A. With Morgan & Wright rubber tire machine.

Q. 23. How tight would you pull or stretch these wires with this machine before brazing them in position to hold or fasten the tire in the channel?

Objected to as calling for conclusions, and as immaterial.

A. As tight as the wires would allow.

Q. 24. That is, without breaking, you mean?

A. Without breaking.

Q. 25. After these tires were stretched and locked in position in the channel by this machine and these wires pulled to their straining capacity and brazed, did those tires ever rise and fall at their base or the wires rise and fall in any strain put on the wheel in travel? 1387

Objected to as incompetent, being clearly for matters not within the knowledge of the witness, and as calling for conclusions, and incompetent and immaterial.

A. Now, wait a minute; I have never stretched any tires on the wheels. I don't stretch on these kind.

Q. 26. You mean the two outside wires you don't stretch on? 1388

A. No, these here. I don't know what you are talking about now.

Q. 27. Did you ever use a machine, a Morgan & Wright machine, as you have stated, to stretch or tighten the two internal wires of a solid rubber tire and fasten that tire into position on a wheel?

A. Yes, sir.

Q. 28. And those were the 3,000 or 4,000 tires you just testified to a moment ago, were they?

Objected to as leading.

A. Yes, sir. 1389

Q. 29. Now, Mr. Nolting, what I want to know is this, after you had fastened this solid rubber tire on the wheel by stretching the two internal wires to their utmost capacity by the Morgan & Wright machine, did you ever know yourself, or did you ever hear of a tire so fastened rising or falling at its base on the channel or the wires themselves tipping or tilting by any kind of a strain that was put upon the exposed portion of the tire by traveling around among the car tracks of the city or over the worst roads?

Same objection as to Q. 25 and for the same

1390 reasons heretofore given in objections to similar questions in previous deposition, it being obvious that the witness has no means of knowing and what has been told him is incompetent and immaterial.

A. Not those that I have put on.

Q. 30. How were those tires that you put on or that you have ever taken off, worn or destroyed; what was their condition when taken off?

Objected to as immaterail and also as incompetent and calling for conclusions of the witness as to devices not present.

1391 A. The wire was pulled through the bottom. Cut through the bottom of the tire.

Q. 31. How many of the tires, as to proportion that you have taken off these wheels, were completely worn out as to their tread or wearing surface without cutting through the wires? Give about the proportion.

Last objection repeated.

A. About seventy-five out of a hundred.

Q. 32. Were cut out or worn out, do you mean?

A. Worn out.

Q. 33. Of these three or four thousand old tires that you have taken off of different wheels in the last four

1392 years what proportion of those tires, if any, were rusted or more or less corroded or stuck as to their canvas and rubber base to the wheel rim?

Last objection repeated; also objected to as leading.

A. I would judge about seventy-five out of a hundred were stuck.

Q. 34. About what force would be required to tear these tires loose or separte them from the rim base?

Last objection repeated.

A. Some of them I could pull out by hand; some of them I had to pound out with a hammer.

Q. 35. Does Frank Parmelee & Company, your present employer, use these two solid internal wire tires now? 1393

A. He uses the side wire.

Q. 36. Like the tire shown in a wheel here that is marked "Defendant's Exhibit External Side Wire Tire"?

Objected to as immaterial.

A. Yes, that's it; that's the one.

Q. 37. Frank Parmelee & Company is among the largest, if not the largest, transportation company in the United States, is it not?

Objected to as clearly incompetent, the witness having no knowledge on the subject.

A. I think so. 1394

Cross-Examination by Mr. Staley.

X-Q. 38. When and by whom were you asked to testify in this case?

A. I don't know what you mean.

X-Q. 39. When were you asked to come down here and testify?

A. I was asked this morning by that gentleman over there, Mr. Harmer.

X-Q. 40. Did he come out to see you or telephone you?

A. Come up there to see Mr. Nichols. 1395

X-Q. 41. And did he see you at the same time?

A. He saw me.

X-Q. 42. Were you asked to bring any samples of old tires that you had taken off?

A. No, sir.

X-Q. 43. Do you use the Morgan & Wright machine to put on these side-wire tires?

A. No, sir.

X-Q. 44. How long since you used the Morgan & Wright machine?

A. Since I started at Parmelee.

1396 X-Q. 45. You mean since before you started?

A. I quit using the machine when I started at Parmelee's.

X-Q. 46. How long did you work for Millar?

A. Very near two years.

X-Q. 47. How near two years; within a month or two months or what?

A. About two years and nine months. I said nearly three years; you didn't understand me.

X-Q. 48. At that time how many men did Mr. Millar employ?

1397 A. When I started or when I quit?

X-Q. 49. Both.

A. Well, on the average of about five men in the blacksmith shop.

X-Q. 50. And about how many all together in the factory or works?

A. About nine.

X-Q. 51. What kind of carriage or vehicles did he build?

A. Not exactly built new ones, but repaired carriages.

ALBERT NOLTING.

1398 Defendant's counsel thereupon calls Mr. SAMUEL N. POND, the witness heretofore examined in this case, who deposes further as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Are you the same Mr. Samuel N. Pond who has heretofore been sworn and testified as a witness in behalf of defendant in this action?

A. I am.

Q. 2. Complainants' counsel has seen fit to ask a number of impractical witnesses in this case questions having reference to certain testimony you gave in this case, and

showed them "Defendant's Exhibit Pond Drawing No. 1." I now call your attention to "Defendant's Exhibit a Standard Rubber-Tired Wheel," and to the cut-away portion of the rim of such wheel for about 4 inches and the small chamfered out portion of the rubber tire exposing one of the clamping wires and also to the self-evident fact that this wire and rubber base, with canvas attachment on the channel, can be pried or lifted up from the base to a certain extent by the direct vertical leverage of a cold chisel or screwdriver, and ask you if such prying up and flexion or displacement of the wire is substantially represented by your Exhibit Drawing No. 1? 1399

Objected to as immaterial, and the form of question is also objected to. 1400

A. I desire to make it distinctly understood that the drawing referred to in the question, being "Defendant's Exhibit Pond Drawing No. 1," was not intended to represent my own theory and belief as to the behavior of this tire under side thrusts, but rather was intended to show in a somewhat exaggerated form the behavior of the wire on the assumption that the rocking or tipping theory of the complainants was correct. I have tested the exhibit wheel referred to in the question by forcing the blade of a heavy screwdriver under the tire centrally of the cut-away portion of the flange and prying the tire up with it, and I have found that the tire and the adjacent exposed portion of the wire can be raised by such an operation to a slight extent, the tool as thus applied affording an enormous leverage and producing an enormous lifting effect upon the tire and wire; and I found that the wire above and adjacent to the sides of the tool assume substantially the form represented in the exhibit drawing referred to, the angle being perhaps somewhat blunter than as exhibited in said drawing. 1401

Q. 3. In your opinion, Mr. Pond, and have you any

1402 doubt as to the matter, can any such lifting effect be produced on this wire or on the base of the tire seated in the channel, as shown by your drawing and as obtained by the leverage of the cold chisel or screwdriver applied directly on the wire underneath as shown in the exhibit—can any such movement or lifting of the wire be produced by any side thrust or pressure on the resilient free rubber above the metal rim and at right angles to the load or pressure always present at the bearing point or the lifting point in actual travel of the vehicle?

Question objected to on the ground that it is immaterial and that the witness has answered substan-
1403 tially this same question before.

A. In my opinion it cannot, and I have no doubts whatever as to the matter, and for these reasons: In the first place, by exerting as powerful a lateral thrust on the tire at the exposed part referred to in my last answer, I observe that the rubber above the wire bends and flows over against the side flange on the opposite side, but I do not observe the slightest raising or disturbance of the wire. The action produced by hand pressure is substantially that indicated in Fig. 4 of my Exhibit Drawing No. 2, except that the side of the tire lying against the
1404 flange on that side from which the thrust is applied yields away from the side flange slightly more than indicated in my Fig. 4, to about the extent indicated in my Fig. 5; but this is due to the fact that in my manual experiment the rubber of the tire at this point is not under compression, such as would be represented by the weight of a load in actual experience.

In the second place, and as a further reason why such a side thrust on the exposed portion of the rubber does not lift the wire, it should be remembered that this thrust is not imparted in a direct radial direction, as in the experiment with the screwdriver or cold chisel, but rather

at right angles to such radial direction, and consequently 1405
that component of the force of the thrust that acts to lift the wire is greatly reduced as compared with the amount or volume of the force itself. If the wire were to rise under such a force laterally applied it could be only by reason of the outward pull exerted through the rubber body of the tire, such pull depending for its effectiveness upon the abutment which the tire has against the flange on the opposite side; and since, as I above stated, this pull is not exerted in a radial direction, but only a small component of it, if any, tends to pull the wire up, it is evident to me that it would require, in order to raise the wire, an enormous side thrust or stretching strain on the 1406
rubber of the tire, such as the latter would not stand without disruption.

In the third place, the rubber being under compression at the time and point of application of the side thrust (in actual experience), any lifting effect must be to a certain extent, in the face of and in opposition to the compressive effect of the load tending to keep the tire to its seat.

Q. 4. I call your attention to the cut-away portion of the rubber for about 5 inches of the tire as to the exposed portion above the flanges, and exposing the clamping wires themselves, and ask you if you can see or detect the 1407
slightest movement of the wires by any lateral thrust that you can put upon the free rubber above them at the exposed cut-away ends?

Objected to as immaterial.

A. I have tested the exhibit in the manner indicated in your question, and do not discover that the most powerful side thrust which I can apply by hand to the severed end of the exposed portion of the tire budges the wire a hair.

1408

Cross-Examination by Mr. Staley.

X-Q. 5. Mr. Pond, when was this particular exhibit the rubber-tired wheel you have been talking about and the fact that the wires and rubber could be raised by inserting a screwdriver under the rubber first brought to your attention?

A. The exhibit was first brought to my attention on December 31, 1907, and I experimented on the same with a screwdriver a few days later, I think about the 2nd of January, 1908.

1409 X-Q. 6. Was this not a week ago today, about Saturday noon or soon after noon?

A. I have no record as to the exact day when I experimented with it, and cannot state any more closely than I have already done. I recall that my experiment was made at some time after the small notch exposing of the wire laterally was made.

X-Q. 7. Do you not recall that this was done after the adjournment about 2 o'clock on last Saturday, a week ago today?

A. I don't recall as to that.

1410 X-Q. 8. Well, Mr. Pond, do you recall whether or not at any time when you made these experiments the witness Smith who was at that time on the stand and who is now present here was present?

A. I could not state positively whether he was or not. I have no recollection of the matter.

X-Q. 9. Did these experiments with the screwdriver take place in your own room or in this room where the testimony was being taken?

A. In this room.

X-Q. 10. Do you recall whether anybody was present, and if so, who?

A. I recall experimenting twice with it, on one of

which occasions Mr. C. K. Offield was present; on the other occasion I was alone. 1411

X-Q. 11. But you would not be positive whether Mr. Smith was present at any time or not?

A. No.

X-Q. 12. Do you remember to have seen Mr. Smith here on the afternoon of Saturday last?

A. I certainly did not because I was in Dayton, Ohio, all day last Saturday.

X-Q. 13. Well, was this, then, on Monday morning after you had returned to the office that you made these experiments?

A. It may have been; I cannot remember positively. 1412

SAMUEL N. POND.

Defendant's counsel states that it is now Saturday afternoon, January 11, 1908, and that the time limit obtained from the court by the complainants upon the defendant to put in their defenses, namely, forty days, has now closed; that defendant has put in their defenses in compliance with this order of court by substantially continued occupation and time to the extent possible under the circumstances as shown by this record, taking into consideration the holiday season and Sundays that intervened and the fact that the testimony taken must of necessity come from witnesses actively engaged in their business and whose time must be consulted as to the giving of their depositions; that there is evidently, if not admitted by complainants' counsel, a great mass of testimony which should yet be taken of exactly and precisely and substantially the same character as shown in the depositions of the various witnesses already taken as to questions of fact therein disclosed; that equally manifest to make this testimony ef- 1413

1414 fective the depositions of witnesses should be taken in the leading cities, large and small, of the United States, where rubber tires of the kind and character disclosed in the Grant patent in suit and the associate parts have been used for, say eight or ten years past; and as shown by the witness Knight last examined, Mr. Charles H. Knight, and familiar with the use and application of these tires in twenty-seven states, that substantially the same kind of testimony as to the use, condition and application of the tires of the Grant patent could be obtained in the cities of all these twenty-seven states as obtained at this city,
1415 and for these reasons and to save any further trouble or expense of both parties in taking such testimony, or any trouble of applying to the court for leave to take such testimony, defendant's counsel asks complainants' counsel, first, if he will admit that witnesses having knowledge of these facts as to the application and removal of the tires of the Grant patent in suit in the principal cities of the United States would testify substantially as to these matters, as shown by the depositions of the sixteen witnesses as to questions of fact that have been
1416 examined at this city; defendant's counsel does not ask complainants' counsel to admit that the testimony is accurate as to the matters stated, but simply that if these witnesses if so called would so testify; second, if complainants' counsel refuses to so admit, defendant's counsel asks complainants' counsel if he will assent to the trial court, Judge Holt, under the fact as appearing in this record, extending the time of defendant to take this testimony, and this testimony only in these various cities and states as above identified.

By Mr. Staley: As quite frequently occurs,

complainants' counsel differs from defendant's counsel as to his statement of facts and as to what the record shows; inasmuch, however, as the record shows for itself and any pertinent facts can be verified, sees no occasion for discussion or argument of such questions. He will state first that he does not feel called upon from the record made in this case to make any admissions such as are called for; and further that he can hardly conceive as to why he should be asked to make such admissions in view of the record, hence he must most respectfully decline both the first and the second interrogatory. 1417

Complainants' counsel further hereby hands to defendant's counsel a printed copy of complainants' *prima facie* proof in this case and gives notice that the complainant will ask to have the case set down for hearing at the earliest possible date. 1418

State of Illinois, County of Cook, ss.

I, Frederick C. Goodwin, a notary public in and for the county aforesaid, do hereby certify that the foregoing depositions of Louis F. Kuehne, Charles F. Hudson, Fred C. Koenig, Charles H. Smith, Leroy Eighme, Harvey Edgerton, Fred M. Meckel, Albert Bubser, Robert H. Wenz, Frank C. Gorman, Homer C. Knight, Fred Krumdick, Frank Glemblow, Jacob E. Hansen, Edgar W. Samuels, Ernest R. Wickstrom, Charles H. Knight, Albert Nolting and Samuel N. Pond were taken before me at the time and places therein specified, pursuant to due notice given; that the parties to said cause were present at the taking of same, complainants by their counsel, Mr. Paul A. Staley and Mr. Border Bowman, and defendant by its counsel, Mr. Charles K. Offield; that be- 1419

1420 fore deposing the said winesses were by me first duly sworn to tell the truth, the whole truth and nothing but the truth in the cause now pending in the United States Circuit Court for the Southern District of New York, wherein the Consolidated Rubber Tire Company and The Rubber Tire Wheel Company are complainants and the Diamond Rubber Company of New York is defendant; that said depositions were reduced to writing from the statements of said witnesses, and the same duly subscribed and sworn to by each of them, as therein appears.

1421 And I further certify that I am neither attorney nor of counsel for any of the parties in said depositions or caption named, and am in no wise interested in the result of said cause.

In witness whereof I have hereunto set my hand and notarial seal this 11th day of January, 1908.

FREDERICK C. GOODWIN,

[SEAL.] Notary Public.

1422

1423

Defendant's Exhibit Original Testimony Illinois Case No. 1.

UNITED STATES CIRCUIT COURT, NORTHERN DISTRICT OF ILLINOIS, NORTHERN DIVISION.

The Rubber Tire Wheel Company, *Complainant,*
vs.
Firestone Victor Rubber Tire Company, Thomas Clements, William Marr, and Harvey S. Firestone, *Defendants.*

In Equity.

No. 24,502.

PAUL A. STALEY, ESQ., 1424
Solicitor for Complainant.

Dear Sir:—

Please take notice that we will take testimony on the part of the Defendants in the above entitled cause, before John A. Shields, Esq., United States Commissioner, at his office in the Post Office Building, in the Borough of Manhattan, in the City, County and State of New York, on Wednesday, December 21st, 1898, at ten o'clock A. M.; the depositions to be taken to be for use on behalf of the defendants at the final hearing of said cause. Said examination will continue from day to day until completed, and the witnesses to be examined will be Mr. Strauss, 1425 and others.

You are invited to be present and to cross-examine, if you so desire.

Chicago, December 15th, 1898.

OFFIELD, TOWLE AND LINTHICUM,
Solicitors for Defendants.

Service of the above notice accepted this .... day of December, 1898, and receipt of copy of same acknowledged.

.....
Solicitor for Complainant.

1426

UNITED STATES CIRCUIT COURT, NORTHERN DISTRICT OF ILLINOIS, NORTHERN DIVISION.

The Rubber Tire Wheel Company, *Complainant,*
vs.
Firestone Victor Rubber Tire Company, Thomas Clements, William Marr, and Harvey S. Firestone, *Defendants.*
In Equity.
No. 24,502.

Testimony taken on behalf of defendants, under and pursuant to the 67th Rule of the Supreme Court, as
1427 amended, in Equity, before John A. Shields, Esq., as Commissioner and Special Examiner, at his office in the Post Office Building, New York City, on Wednesday, December 21, 1898 at 10 A. M.

Appearances: Paul A. Staley, Esq., on behalf of complainants. Charles K. Offield, Esq., on behalf of defendants.

There being no witnesses present, at request of defendants' counsel a recess is taken until 2 P. M.

NEW YORK, Wednesday, Dec. 21, 1898. 2 P. M.

1428 Met pursuant to adjournment.

Present: Counsel as before.

And thereupon the following proceedings were had.

Defendants' counsel offers in evidence certified copy of original specification, oath and drawings filed by James G. Rodgers in the Patent Office July 14, 1894, and requests that the same may be marked "Defendants' Exhibit Rodgers original application" and that the same may be identified with this record.

Defendants' counsel also offers in evidence certified copy of original specification, oath and drawings, filed

by Blosser and Kunkle in the Patent Office July 23, 1894, and requests that the same may be marked "Defendants' Exhibit Blosser and Kunkle original application" and that the same may be identified with this record. 1429

The above named exhibits and each of them are objected to by complainant's counsel first, on the ground that they are irrelevant and immaterial second, on the ground that they are wholly incompetent as a part of the prior art or as anticipation as they are not and do not purport to be prior printed publications or patents but are simply copies of secret documents alleged to have been filed in the Patent Office and having no bearing upon the questions at issue in this cause and legally incompetent as evidence. 1430

Defendants' counsel states that in a pending case of this same complainant against The Columbia Pneumatic Wagon Wheel Company pending in the United States Circuit Court for the Southern District of New York, the subject matter of such case being as to the patent in question precisely the same as in this case—that the patentee Arthur W. Grant in that case was called as a witness in behalf of complainant and interrogated upon his cross examination as to the date and time when he got up and began experimenting with tires like or substantially like the rubber tire represented by the patent in suit—and that in said case in the Southern District of New York said patentee testified positively and unequivocally that he got up the tire of the patent about July or August, 1894—and that said patentee further testified upon cross examination when compelled to fix a time when he first began experimenting with the tire described in the patent in suit testified as follows upon page 83 cross Q. 66. 1431

"A. I cannot remember the exact time but it was some time in the latter half of 1894."

1432 Defendants' counsel asks complainant's counsel that if he will admit said patentee so testified for the purpose of avoiding the expense, delay and trouble of proving such fact by the routine manner.

Complainant's counsel replies that he will not admit this fact and further that he objects to the foregoing statement as improper and incompetent to put upon the record alleged facts and moves to strike the same from the record on the ground that the same is incompetent.

Adjourned to Thursday, December 22, 1898, at 11 A. M.

1433

Rubber Tire Wheel Co.
v.
Firestone Victor Rubber Tire Co. *et al.*

NEW YORK, December 22, 1898.

Met pursuant to adjournment.

Present: Counsel as before.

There being no witnesses present up to 1 P. M. an adjournment was taken until 2 P. M. at the request of defendants' counsel.

2 P. M.

1434 Met pursuant to adjournment.

Present: Counsel as before.

Complainant's counsel here states that he is present at this session under notice from defendants' counsel for the examination of witnesses in the above entitled cause under the 67th Equity Rule which examination was to have been begun at 10 A. M. of yesterday, December 21st. That inasmuch as no witnesses appeared he consented to the adjournment until 11 o'clock this morning and again until 2 P. M. to day. He further states that he appeared here against his personal desires and after canceling other engagements that he has traveled several hundred

miles from his home in Ohio to be present pursuant to 1435
said notice and is under expense in remaining here; that while he is perfectly willing to accommodate counsel for defendant as far as possible yet he feels that the professional courtesy must soon give way to justice to his client and asks that if defendants' counsel cannot proceed with the examination of witnesses that the session be terminated.

Defendants' counsel states that the examination of witnesses will be proceeded with at such speed as the witnesses can and will attend; that the witnesses to be called are men of large business affairs and have no inter- 1436
est in this case one way or another and seem to be different somewhat from the line of witnesses called by the complainant, and defendants' counsel calls the attention of the court that but little time has been taken upon the part of defendants in putting in their defenses in this case and that but few cases can be found where defendants have wasted less of complainant's time than in this case and defendants' counsel in the line of the sincerity of the above objection of the complainant's counsel, asks complainant's counsel that in other litigations upon this same patent if he and defendants' counsel in such cases have not simply spent month's of time in the taking of 1437
testimony and accumulated bound volumes of so-called proceedings in such cases.

Complainant's counsel replies as to the above inquiry that as he understands it he answers no, but it is not the taking of testimony that is complained of but the failure to do so. As to the witnesses defendant's have the right to subpœna their witnesses if the testimony is of value. And so far as complainant's counsel knows in the proceedings referred to by defendants' counsel in other cases this means of obtaining the presence of witnesses was always resorted to by counsel for both sides with the re-

1438 sult that there was so far as his knowledge goes at no one time a delay equal to half the delay which has occurred at this session.

Defendants' counsel states that bearing upon this question, if it can have any relevancy at all or influence upon the mind of the court he will endeavor as possible to introduce as exhibits in this case the record made up by complainant's counsel and defendants' counsel in the recent suit of this same complainant vs. Columbia Wagon Wheel Company in the U. S. Circuit Court For the Southern District of New York.

1439

And thereupon defendants' counsel called as a witness in the defendants' behalf MR. JAMES W. PITNEY who, being first duly sworn, testified as follows in answer to interrogatories propounded by Mr. C. K. Offield:

Q. 1. Please state your name, age, residence and occupation?

A. James W. Pitney; age 60; residence, New York; carriage maker for thirty years, livery stable keeper about twenty.

Q. 2. In what part of the city is your livery stable?

1440

A. 153, 155 and 157 East 32nd.

Q. 3. How long have you had your place of business there?

A. About thirty years.

Q. 3. How does your business as liveryman compare with that of others in the same business in this city?

A. I get my fair share of it.

Q. 4. What was your class of customers?

A. I have a good class; A No. 1 people.

Q. 5. Do you have what I understand you liverymen call boarders in addition to your own plant?

A. Yes, sir.

Q. 6. Do you have what I understand in this city you 1441
term "calls" from any of the leading hotels?

A. Yes, I do the work of two, The Netherland Hotel, The Metropole, The Gerard, The Sturtevant House and one or two clubs.

Q. 7. Have you in the last few years and your boarders used rubber tires on your cab or vehicle wheels made by the Rubber Tire Wheel Company like the sample of tire which I now show you marked "Complainant's Exhibit sample of Complainant's Tire"?

Question is objected to, first as leading and second as irrelevant and immaterial.

1442

A. Yes, sir.

Q. 8. For how many years have you used and been familiar with this rubber tire?

Same objection.

A. About two years.

Q. 9. Have you ever had one of these Rubber Tire Wheel Company's tires wear out in use or known of it to wear out in use?

The question is objected to as irrelevant and immaterial inasmuch as it has already appeared that this form of tire introduced by complainants and copied by defendant has been almost if not quite universally 1443
used and has supplanted other forms of tire on the market. Any defects in the said tire which are common both to complainants and defendants would be irrelevant and immaterial.

Defendants' counsel objects to the above statement of complainant's counsel miscalled an objection, as not representing the facts appearing as testimony in this case.

A. None that I have had put on myself.

Q. 10. What happens to all of the Rubber Tire Wheel

1444 Company's tires on vehicles owned by you or in your establishment before they wear out?

The last objection is repeated and by consent and to save repetition this objection is made to each and every question and answer in this line of examination.

A. I should call it creeping, I suppose, shifting back and forwards, tying up into a knot like and cutting right through the wire, so that to get it smooth I would have to take out eight to ten inches. They cut off at the bottom and slip off the tire entirely.

1445 Q. 11. What do you do with these Rubber Tire Wheel Company's tires when they cut out at the bottom in this manner?

A. We send them back to the factory and have other pieces put in—parts of tires—sometimes all new.

Q. 12. How many tires of the Rubber Tire Wheel Company's tires have you ever known to wear out in use in distinction from being destroyed by cutting before they are worn appreciably?

A. I had one set on a second hand brougham that I bought of Brewster; they wore out almost down to the iron so that I had to have a new set put on.

1446 Q. 13. And that is the only instance?

A. That is the only one that I remember.

Q. 14. Are rubber tires of any kind or description used on any kind of vehicles in this city except carriages or analogous vehicles for personal comfort and use?

A. I don't quite understand that.

Q. 14. I mean express wagons and other vehicles used approximately as business wagons?

A. Yes, sir, such as Altman's and large dry goods houses.

Q. 16. Do you mean that some of those express wagons such as Altman's have rubber tires?

A. Yes, sir. 1447

Cross-Examination by Mr. Staley.

X-Q. 17. How long have you been using rubber tires?

A. About two years.

X-Q. 18. What other makes of rubber tires have you used besides the Rubber Tire Wheel Company's?

A. The Standard and a 38th Street firm whose name I have forgotten and George Meyer's.

X-Q. 19. Any other makes?

A. I have bought carriages with other makes on, Sargeant's, the old style, when they first came out. 1448

X-Q. 20. What was this old style you refer to?

A. It was a solid tire; that is all I know.

X-Q. 21. Was it what was known as the English or clincher tire which was held on by clinching the sides of the flanges in against the rubber?

A. Yes, sir.

X-Q. 22. This old form of tire has been supplanted by this new form of tire, has it not?

A. Yes, sir.

X-Q. 23. And George Meyers puts on what is the same as the American tire, which is the 38th Street tire?

A. Yes, sir. 1449

X-Q. 24. And all these tires, I mean by that the Standard and the American and George Meyers are the same style as this exhibit which you examined?

A. Yes, sir, put on the two wires except that the wires are joined with a twist instead of being welded.

X-Q. 25. Your understanding is that the creeping of the tire in the channel has been the trouble with these tires and caused the wires to cut through before the rubber was worn out is it?

A. Well, I think that the cause of the creeping was the wearing out of the rubber under the wire.

1450 X-Q. 26. I understand then, according to your idea, the rubber would first wear under the wires and then the tire would creep in the channel?

A. Yes, sir.

X-Q. 27. How many vehicles of your own do you have equipped with rubber tires?

A. Fifteen or eighteen.

X-Q. 28. How many of these are equipped with the Rubber Tire Wheel Company's tires?

A. Well, over one half of them.

X-Q. 29. Do you ever use any Firestone or Firestone Victor tires?

1451 A. Not to know it. I have put on that firm in Chambers Street, I put on a new set of theirs.

X-Q. 30. You had the same trouble with all these modern wired on tires made by the people you named, did you?

A. Yes, sir.

X-Q. 31. Have you had any tires put on by the Rubber Tire Wheel Company within the last year?

A. Yes, sir.

X-Q. 32. When and what size and on what kind of vehicles?

1452 A. Coupays, I think an inch and five eights, during the last fall; I am trading with them right along.

X-Q. 33. How long have you had tires put on by the Rubber Tire Wheel Company in actual use?

A. I bought six or eight new carriages with their tires about fifteen months ago perhaps, from Armstrong & Company, New Haven.

X-Q. 34. And these tires are still in use, are they?

A. We have had a good many new ones put on since on these same carriages; I don't know that any of them are running the original tires on them yet.

X-Q. 34. But are you willing to state positively that 1453
some of them are not?

A. No, I am not.

X-Q. 35. And have all these tires crept or moved in the channel in the way you have referred to; I mean on these six vehicles?

A. A great many of them; I can't say all of them.

X-Q. 36. Have you examined each of them specifically to find out whether this is true or not?

A. No, I have not; I have to send them back to the factory quite often to have them fixed; every day or two; I have some one or two wheels to send back to the fac- 1454
tory.

X-Q. 37. That is out of these eighteen or more sets which you have if the different makes you are frequently sending them back to be repaired?

A. Yes, sir.

X-Q. 38. If this creeping that you have referred to could be avoided the difficulty you refer to would be prevented, could it not?

Objected to because the witness has not shown himself to be an expert on this matter and because plainly the tires would cut out at the sides if they did not creep or tear out at the bottom. 1455

Mr. Staley: The last part of the statement miscalled an objection is seriously objected to as an alleged statement of fact not warranted by anything in the record.

A. To a great extent, yes.

X-Q. 39. Of the three makes of tires you have mentioned, that is the Rubber Tire Wheel Company, the Standard and the George Meyers or the American which can you buy the cheapest?

A. The George Meyers.

X-Q. 40. And so far as you know which of these com-

1456 panies first put on the market these modern wired on tires like the sample you have referred to?

A. The Rubber Tire Company, Broadway and 58th Street.

X-Q. 41. Do you know that the 38th Street concern was first known here as the Columbia Wagon Wheel Company and afterwards changed its name to the American Rubber Tire Company?

A. Yes, sir, I think I do.

Re-Direct by Mr. Offield.

1457 R-D. Q. 42. This clincher tire that you say has been supplanted by the new form of tire—what price did you pay per set for this clincher tire?

A. You misunderstood me about that I think; I bought the carriage with them on.

R-D. Q. 43. Do you know how much extra the carriage cost you by reason of having this clincher tire on?

A. No, sir.

R-D. Q. 44. And you don't know but that those clincher tires were sold for as much again per set than the new form of tire?

The question is objected to as wholly incompetent
1458 and grossly leading and containing inferences unwarranted by any facts either in or out of this record.

A. No, sir.

R-D. Q. 45. The channel iron holding in the clincher tire on the wheel was a much more difficult iron make and more expensive than the channel iron of the new form of tire was it not?

The last objection is repeated and complainant's counsel suggests that defendants' counsel should not cross-examine his own witness.

Defendants' counsel calls the attention of the

court to the fact that complainant's counsel made the witness his own as to this old form of clincher tire and that defendants' counsel has a right to cross examine the witness upon this new matter and that complainant's counsel must abide by the testimony of the witness in answers given. 1459

A. Yes, sir.

Re-Cross Examination by Mr. Staley.

R-X Q. 46. How do you know that the clincher channel is more expensive than the modern channel?

A. As a carriage man, the round edge and the welding would be twice as expensive. 1460

R-X Q. 47. You mean that that is your opinion, not from actual experience?

A. Well, yes, that is my experience in welding them and putting on tires.

R-X Q. 48. You mean to say that you yourself have put on both forms of these rubber tires?

A. I have put on the round edge tire under the Corbett & Shark patent.

R-X Q. 50. But not the Sargeant tire you refer to?

A. No, not the Sargent.

JAMES W. PITNEY, 1461

Sworn before me.

JOHN A. SHIELDS,
United States Com.
and Special Examiner.

Adjourned to Friday, December 23, 1898, at 11 A. M.

1462

NEW YORK, December 23, 1898.

Met pursuant to adjournment.

Present: Counsel as before.

And thereupon defendants called as a witness SAMUEL LAWSON, who being first duly sworn testified as follows in answer to the interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation?

A. Samuel Lawson; I am 56 years old; residence
1463 New York, 107 East 15th Street; I am an engineer; that is my occupation.

Q. 2. Have you any particular or special occupation that has brought you in contact with and given you knowledge of the application and use of rubber tires for vehicles principally for personal use and passenger traffic?

A. Yes, sir.

Q. 3. What circumstances have given you this knowledge?

A. I have been connected with the livery business.

Q. 4. What livery business, where and for how long?
1464 A. 133-15 East 15th Street, the Irvin Stables. I have been connected with that for seven years.

Q. 5. How are you connected with it?

A. I am half owner of it.

Q. 6. Have you given your personal attention to the business during that time?

A. What do you mean? All my time to it?

Q. 7. A sufficient length of time at least to familiarize yourself with the business?

Question objected to as irrelevant and immaterial and leading.

A. Yes. 1465

Q. 8. How does your livery business compare in volume and in value with your competitors in the same line?

Objected to as incompetent, irrelevant and immaterial. The question to be competent should ask for facts and not conclusions.

A. Compared to some we do a small livery business.

Q. 9. Compared to others?

A. We do a small livery business but there are lots of men who do more.

Q. 10. How about the number who do less?

Same objection as to Q. 8.

A. I don't know anything about what other people do. 1466

Q. 11. Do you keep what I believe you gentlemen call boarders?

A. Yes, sir.

Q. 12. Do you use rubber tires on your cabs and vehicles?

A. Yes, sir.

Q. 13. Have you ever used a rubber tire like the sample I now show you marked "Complainant's Exhibit Sample of Complainant's Tire"?

Objected to as leading, and as irrelevant and immaterial. 1467

A. Is this the Broadway? Of course I can't tell.

Q. 14. But you have used a tire like this sample?

Last objection repeated.

A. Like this, yes, sir.

Q. 15. For how many years in your business?

A. Well, I have used rubber tires for about four years.

Q. 16. Substantially like this one?

A. Yes, sir.

1468 Q. 17. What if anything happens to these tires in use?

The question is objected to as irrelevant and immaterial inasmuch as it appears in this evidence that this form of tire introduced by the complainant and copied by defendants has supplanted the old form of tire on the market, hence it is immaterial and irrelevant as to what happens to the tire in use.

Defendants' counsel protests such statement as not representing any facts in this record.

A. Well, I tell you, what I find in them they cut through; and the rubber becomes loose, of course.

1469 Q. 18. Whereabouts on the tire do they cut through?

A. Where the wire passes through to hold them on.

Q. 19. Do they cut through at the sides or at the bottom of the tire?

A. I have had the wire come through the sides; most frequently, through the bottom.

Q. 20. Mr. Lawson, have you ever known one of these tires like Complainant's Exhibit Sample of Complainant's Tire to be worn out with use instead of being destroyed by cutting out at the sides or bottom, as you have described?

The question is objected to as leading, as incom-
1470 petent, as calling for a conclusion and as irrelevant and immaterial for the reason stated in objection to Q. 17.

A. All I can say for the times that I have used myself—I had to have new tires put on when I didn't think they were more than half worn out.

Q. 21. Have you ever had a single set of tires or even one tire that wore out by use before it was destroyed by cutting out through the wire?

Last objection repeated.

A. Yes, I have.

Q. 22. How many? 1471

Same objection.

A. I have had one Brougham.

Q. 23. Any other instances except this one brougham?

A. One brougham that I know of.

Q. 24. Can you recollect any other except the one brougham?

A. No, I don't know as I do.

Q. 25. Were the rubber tires that you first used as you have described, the rubber tires of the Rubber Tire Wheel Company, that had a place of business on 58th Street?

A. 58th and Broadway? 1472

Q. 26. Yes.

A. Yes, sir.

Q. 27. About how many vehicles or cabs do you own or use in your livery business equipped with these rubber tires, in distinction from your boarders?

A. I run about five.

Cross-Examination by Mr. Staley.

X-Q. 28. Why do you use rubber tires on your vehicles?

A. I think it is an improvement on the vehicle.

X-Q. 29. You say that you are an engineer by occupation; do you follow this occupation? 1473

A. Yes, sir.

X-Q. 30. Where?

A. At the corner of Howard and Centre, 203 and 205 Centre Street.

X-Q. 31. Just go on and state so that we may understand, what place this is and what your duties are there as engineer?

A. I carry on business there; I build gas engines and oil engines and my duties are to design them; I take care of the mechanical part of the place.

1474 X-Q. 32. Is this manufacturing plant your own business or are you employed there?

A. I am a partner; I own a half interest in it.

X-Q. 33. To which do you give the most of your time, the manufacturing business or the livery business?

A. My time is divided.

X-Q. 34. Who is your partner in the livery business?

A. Alonzo T. Welch.

X-Q. 35. Does he devote his time to the livery business, or how is that?

A. He devotes his evenings; he comes up there about six o'clock.

1475 X-Q. 36. And you have a manager or foreman or something of the kind around the stable?

A. Yes, sir.

X-Q. 37. And what is his name?

A. William Sutherland.

X-Q. 38. And what do you call him, manager?

A. Yes, sir.

X-Q. 39. Do you use the Broadway or Rubber Tire Wheel Company's tire exclusively?

A. No, sir, not now.

X-Q. 40. What other makes?

1476 A. The Standard.

X-Q. 41. Any other?

A. No.

X-Q. 42. The Standard is of the same type, substantially the same as this sample which you have referred to before marked Complainant's Exhibit Sample of Complainant's Tire?

A. Yes, sir.

X-Q. 43. How many tires have you now in use of the Broadway or Rubber Tire Wheel Company's make?

A. I haven't got any of the Broadway, that is the Broadway and 58th Street.

X-Q. 44. When you have referred to the Broadway tire you have referred to the one put out by the Rubber Tire Wheel Company whose place of business is on Broadway between 57th and 58th Street, have you not, and that tire is quite generally known in New York as the Broadway tire? 1477

A. Yes, sir.

X-Q. 45. When you have referred to the cutting out of the tires you refer to this wired on kind of tire without reference to what was made by the Standard or Broadway Company, did you?

A. Yes, sir. 1478

X-Q. 46. How long since you have purchased any of the Broadway tires?

A. I guess it is about the first tire I used.

X-Q. 47. What I meant was when did you purchase the last you got?

A. I have never had but two lots from them—two broughams from them.

X-Q. 48. Then the troubles which you have had with the cutting through of the wires has been principally with the Standard?

A. I have had no trouble with the Standard cutting through. 1479

X-Q. 49. Well then what brougham was it that you say the tires wore out?

A. The brougham that the rubbers were put on by the Standard people.

X-Q. 50. And when was that first put into use?

A. That is a year ago; perhaps a little more; of course I cannot tell exactly the date.

X-Q. 51. Was this the first brougham that you had equipped with the Standard Rubber Tire?

A. No, it wasn't the first brougham.

X-Q. 52. Then all the rest of the tires which you

1480 now have in use are in good condition and are not cut through, is that right?

A. Yes, sir.

X-Q. 53. And they have all been in use for more that a year?

A. Yes.

X-Q. 54. Fix as near as you can when you first bought a set of tires substantially like this sample which you before referred to from the Standard Company?

A. From the Standard Company? Well, I can't fix the time.

X-Q. 55. As near as you can?

1481 A. I am not sure of the time on that.

X-Q. 56. Well, would you say as much as 18 months ago?

A. Oh, yes, it was over two years; maybe three years ago.

X-Q. 57. As I understand it then you haven't bought any of the Broadway tires within the last 18 months?

A. No.

X-Q. 58. This form of tire which you say you have used, is used almost if not quite exclusive in New York, is it not?

1482 A. Yes.

Re-Direct by Mr. Offield.

R-D. Q. 59. Are you the inventor and builder of the Lawson gas engine?

A. Yes, sir.

R-D. Q. 60. Were you subpœnaed to come here and give your deposition?

A. No.

SAMUEL LAWSON.

Sworn before me.
JOHN A. SHIELDS,
United States Com.
and Special Examiner.

2 P. M.

Defendants' counsel here offers in evidence U. S. 1483
Letters Patent granted to Biers Smith dated April 1st, 1890, and numbered 424,452, and requests that the same may be marked "Defendants' Exhibit Biers Smith 1890 Patent"; also U. S. Letters Patent granted to Meyers dated February 16, 1892, and requests that the same may be marked "Defendants' Exhibit Meyers 1892 Patent." Also British Letters Patent granted Walker dated September 10, 1897, and requests that the same may be marked "Defendants' Exhibit Walker British 1897 Patent." Also British Letters Patent granted Crowther No. 1484
9,600 granted in the year 1892, and requests that the same may be marked "Defendants' Exhibit Crowther British of 1892."

Defendants' counsel states in this connection that as he now recollects it, not having the papers with him, these patents are not set up and identified by defendants' answer and that their offer in this connection to show the existence and condition of the art in the same industry antecedent to the date of the Grant patent in suit.

Complainant's counsel objects to the foregoing as irrelevant and immaterial, and reserves the right to 1485
object to the documents or copies thereof when the same are produced at the hearing or any time.

And thereupon defendants called as a witness, WILLIAM H. SEAICH, who being first duly sworn, testified as follows in answer to interrogatories propounded by Mr. Offield:

Q. 1. Please state your name, age, residence and occupation?

A. William H. Seaich; age 54; livery business; 118 West 76th Street is my private residence.

1486 Q. 2. Where is your place of business in this city?

A. 40 to 50 East 32nd Street.

Q. 3. For how long a time have you been engaged in the livery business in New York City?

A. Forty years.

Q. 4. Mr. Seaich, if there is no objection, please state approximately at least, how your business as liveryman compares as to volume and value with the principal liverymen in this city?

Question objected to as incompetent, calling for a conclusion and not facts and as irrelevant and immaterial.

1487 A. We stand pretty high; that is all I can answer. I think that will cover it.

Q. 5. Is there any single liveryman in your line and rank in that business who has a larger business than yourself?

Last objection repeated.

A. No single man; none.

Q. 6. If you have the patronage or what I believe you liverymen speak of as the "calls" of any leading hotels in New York, please designate them?

A. I have the Waldorf Astoria, Holland House,
1488 Cambridge, Park Avenue and some clubs, besides my own private business.

Q. 7. Is any department of your business composed or consists of what I understand you to term boarders?

A. None; I have no boarders.

Q. 8. Do you use solid rubber tires on your different vehicles?

A. I do.

Q. 9. For what period of time have you used such tires approximately?

A. I can hardly answer; when they first came out, about three or four years.

Q. 10. What proportion of your vehicles are equipped with these solid rubber tires? 1489

A. Over 100 per cent.

Q. 11. Can you state approximately without referring to your books about how many of your vehicles of all kinds are equipped with tires of this kind?

A. A rough estimate, about 125.

Q. 12. Will you please look at this section of tire that I now show you that is marked "Complainant's Exhibit Sample of Complainant's Tire" and state whether or not you have used that tire to any extent in your business?

A. That is the Broadway. Oh, yes, largely. 1490

Q. 13. The Broadway tire as you term it is the tire manufactured by the Rubber Tire Wheel Company, is it not?

A. I should so; all I know it is by Broadway.

Q. 14. Will you now please state what happens to these tires like this Exhibit when put to the test of actual use on your vehicles; I mean what is the condition of these tires by reason of such use?

The question is objected to as irrelevant and immaterial inasmuch as the record shows that this form of tire has supplanted the older forms of tire 1491 on the market it is the tire which is nearly or quite universally used, having driven the older forms out of existence and hence any defects which it might contain which are common to the defendants' tire and the other tires copied from this one are irrelevant and immaterial, and this objection is made at this time to cover all the testimony of this witness relating to the subject matter.

Defendants' counsel objects to the above statement as not representing any existing facts or facts disclosed by this record.

1492 A. Well, I have had a great deal of bother with them in splitting in two, had some worn very well indeed, but the majority are constantly repaired or made new.

Q. 15. What do you mean by these tires splitting in two; at what point and in what direction do they split and what in your opinion is the cause of their splitting?

A. I have always been under the impression that it was caused by the wire cutting from hole and the creeping of the tires.

Q. 16. In what direction do the wires cut from the hole, downward towards the bottom of the channel, sidewise or upwards?

1493 A. Run sidewise right around.

Q. 17. Do they cut out about on the level with the top of the flange of the channel?

Objected to as leading.

A. A little below the level.

Q. 18. Mr. Seaich, have you ever had or known of an instance of any of these solid rubber tires like this exhibit wearing out or being worn out in use by the wearing away of the rubber on the tread or exposed surface of the tire before the tire was destroyed by the cutting out of the wires as you have described?

1494 A. Yes, sir, I have in two or three instances only. They wore to the top of the tire in two different instances; that is all I can recall to mind.

Q. 19. Do you personally look after such details of your business as is represented by your application and use of these rubber tires?

A. My attention is called to each and every one of them.

Q. 20. Do I understand that you have carried on your business in practically the same location and place you have designated in this city for forty years?

A. Yes, sir.

Q. 21. Are there any other older livery houses in this 1495
city than yours?

A. I think not.

Cross-Examination by Mr. Staley.

X-Q. 22. You stated that you have been using rubber tires ever since they first came out. Do you mean ever since this particular form of tire came out?

A. I have used quite a number of different rubber tires.

X-Q. 33. Rubber tires have been in use to some extent on vehicles in New York for a longer period than 1496
three or four years were they not?

A. We didn't put them on for some time after they were introduced and it was a long time before we were compelled by the public; the public demanded it.

X-Q. 34. The livery trade generally has adopted rubber tires because their trade has demanded it, have they not?

A. Customers demand it.

X-Q. 35. As a matter of fact liverymen consider it as an extra expense which they have been compelled to undertake, do they not?

A. It is an expense originally, but it is a saving in 1497
the end.

X-Q. 36. That is they are expensive to put on first but they save the vehicle and in that way save repair?

A. Yes, sir.

X-Q. 37. Have all the rubber tires that you have used been made substantially like the sample Complainant's Exhibit Sample of Complainant's Tire?

A. Yes, sir, on the same plan.

X-Q. 38. Were these all of the Broadway make?

A. No. The majority were.

1498 X-Q. 39. What other makes did you use?

A. The American, I think the others a Whitney-Barnes—they put two sets on, guaranteeing them not to creep.

X-Q. 40. Did you ever use any of the Firestone or Firestone Victor?

A. No, sir.

X-Q. 41. Can you think of any other makes that you have used?

A. I have had some hansoms made in Boston that what tires were put on my impression is were the Victor; that I couldn't answer; that is my idea.

1499 X-Q. 42. These were recently put on were they?

A. I bought six of them in the last four months.

X-Q. 43. In the different makes of this form of tire have you noticed any particular difference as to these defects which you have referred to after a corresponding length of use?

A. The last five sets I have nothing done to them whatever as yet.

X-Q. 44. But these as I understand have only been in use a few months?

A. Yes, sir.

1500 X-Q. 45. How about the others which have been in use for a year or more: Do you notice any particular difference in the different makes, I mean for instance the Broadway and the American which you say you have used?

A. No difference, and they are in constant repair.

X-Q. 46. How recently have you bought a new set or sets of tires of the Broadway make?

A. Last week.

X-Q. 47. Have you any in use which you bought new say a year ago of the Broadway make?

A. Have I got any in use? I have.

X-Q. 48. Do you find that they creep the same as 1501
those that you first got?

A. They do.

X-Q. 49. Your experience has been that these different makes of tires give about the same result in the same amount of use?

A. Yes, sir.

X-Q. 50. You referred to two sets that wore out? Where did you get those sets?

A. That is a question I couldn't answer; my impression is they were the Broadway.

X-Q. 51. Could you state about when it was that you 1502
got them?

A. It ran a long time, quite a time and didn't appear to creep and gave satisfaction, and they wore down even with the channel.

X-Q. 52. Well, would you say it was two or three years ago that you got them or less?

A. That is a question I couldn't answer.

X-Q. 53. Of course I did not expect you to state the time exactly, but simply as to your best recollection whether they were among the earlier tires or among the later tires that you speak of?

A. They were the earlier. 1503

X-Q. 54. This form of tire which you say you have used held on by two wires is almost if not quite universally used in New York, is it not?

A. I think so, yes.

X-Q. 55. And as I understand it you never had any experience with earlier tires?

A. I had none.

X-Q. 56. You had seen other forms of tires in use before this was got out?

A. Only those pneumatic tires.

X-Q. 57. You did not know of the tire which Brew-

1504 ster put on that was known as the English or clincher tire?

A. I did not.

Re-Direct by Mr. Offield.

X-Q. 58. It took the liverymen some time to find out that in the long run their vehicles were saved in wear to a much greater extent by the application of rubber tires than the cost of the tire, did it not?

Objected to as leading.

A. It saved a great deal, certainly.

1505 R-D. Q. 59. The question was if it did not take some time for the liverymen to find out that the use of these rubber tires saved very substantially and lengthened the life of their vehicles to which they were attached?

A. There is no question about that.

Re-Cross by Mr. Staley.

R-X Q. 60. Then it is your opinion that the rubber tires save a good deal more than they cost on the vehicle?

A. If they last they will, certainly; it is like the telephone, you can't do without them.

1506 WM. H. SEAICH.

Sworn before me.

JOHN A. SHIELDS,
United States Commissioner
and Special Examiner.

Adjourned until Saturday, December 24, 1898, at 10 A. M.

1507

Rubber Tire Wheel Co.

v.

Firestone Victor Rubber Tire Co.

NEW YORK, December 24, 1898.

Met pursuant to adjournment.

Present: Mr. Offield, for defendants. D. W. Cooper, of counsel for complainant.

And thereupon defendants called as a witness in their behalf EDWARD FRANCIS DELANEY, who being first duly sworn testified as follows in answer to interrogatories propounded by Mr. C. K. Offield:

1508

Q. 1. What is your name, age, residence and occupation?

A. Edward Francis Delaney; age 29; 436 West 57th Street; hackman.

Q. 2. Where is your place of business as hackman?

A. 436 West 57th; that is the stable.

Q. 3. Are you the proprietor or one of the proprietors of the business?

A. I am supposed to be the whole proprietor.

Q. 4. What particular line of business in this hack industry do you conduct?

1509

A. Public hackman.

Q. 5. How does your business compare as public hack with those of your competitors in the same line?

A. I have about as large as any in the business.

Q. 6. Do you use solid rubber tires on your hacks?

A. Yes, sir.

Q. 7. For how many years have you used these rubber tires?

A. From five to six years, I couldn't be positive as to the length of time.

Q. 8. During that time have you used the rubber tires

1510 of the Rubber Tire Wheel Company like this section of tire that I now show you marked Complainant's Exhibit Sample of Complainant's Tire?

Objected to as leading.

A. That is the only kind I use; they are all like that.

Q. 9. What if anything happens to these rubber tires in use so that you have to take them off or quit using them?

Objected to as leading.

A. The wire pulls through.

Q. 10. Pulls through where?

A. Pulls through the rubber.

1511 Q. 11. Whereabouts through the rubber do these wires pull through?

A. Through sideways and through the bottom.

Q. 12. Are the tires any good after the wires are cut out or pull through the sides or the bottom?

A. No, sir, they are no use at all.

Q. 13. Have you ever had or known of a case or instance where the tire itself wore out before it was destroyed by being cut through at the sides or bottom?

A. They never wear out altogether. It is impossible for them to wear out altogether.

1512 Q. 14. Do you mean that the tires are always destroyed by the wires cutting out the sides or bottom before they are worn out?

Objected to as leading.

A. They have always been destroyed with the exception of one or two cases.

Cross-Examination by Mr. Cooper.

X-Q. 15. Do you know who made the sample of tire which is marked Complainant's Exhibit Sample of Complainant's Tire?

A. No, sir.

X-Q. 16. Do you know whether it was made by the 1513
American Rubber Tire Company?

A. No, sir.

X-Q. 17. Do you know of the American Rubber Tire Company?

A. Yes, sir.

X-Q. 18. Did you ever use any tires made by it?

A. I never had but one set put on and that was through an agent.

X-Q. 19. What kind of a wagon did you have it put on?

A. On a Hinks & Johnson hansom.

X-Q. 20. Did the wires cut through the rubber of this 1514
set?

A. Yes, sir, they did.

X-Q. 21. Do you remember how long it wore?

A. The tire on the hind wheel wore six months and the wire cut through sideways; it didn't go through the bottom it went through sideways.

X-Q. 22. Where did you get the first rubber tires which you ever used?

A. They came on a Nichol's hansom that I bought.

X-Q. 23. Do you know what make they were?

A. They put them on; I couldn't tell who they put 1515
them on for.

X-Q. 24. Did you ever buy any rubber tires from the Rubber Tire Wheel Company?

A. One set.

X-Q. 25. When did you buy that one set?

A. About two years and a half ago.

X-Q. 26. What kind of a vehicle was that set put on?

A. A brougham.

X-Q. 27. Do you know about what the weight of the brougham was?

A. About 1250 pounds.

1516 X-Q. 28. How long did that set wear?

A. One rubber wore six months and the other three wore about nine months.

X-Q. 29. What did you do when these rubber tires were out?

A. I sold the rig; I don't know what the party did that bought it.

X-Q. 30. Did you ever use any other rubber tires besides these two sets?

A. Standard Rubber Tire Company.

X-Q. 31. How many tires of the Standard Rubber Tire Company have you used?

1517 A. Eight or nine.

X-Q. 32. When did you put on the first set made by the Standard Rubber Tire Company?

A. That I couldn't say; I am not positive about that.

X-Q. 33. About how long ago was it?

A. You know the way we get rubber tires we get them put on and pay for them right there and then. It was between a year and a year and a half ago.

X-Q. 34. Is that first set still in use?

A. Yes, sir, they are.

X-Q. 35. How many rigs have you in use now?

1518 A. Fifteen altogether.

X-Q. 36. How many of them are equipped with rubber tires?

A. All of them.

X-Q. 37. Where did you buy the rest of the tires besides those about which you have testified?

A. They came with the rigs.

X-Q. 38. Do you know what make they are?

A. Some came from the Rubber Tire Wheel Company and some came from the American Rubber Tire Company.

X-Q. 39. How long have you used those rigs which 1519
came from the Rubber Tire Wheel Company?

A. Some last six months; some last nine months.

X-Q. 40. How long have you used those which came from the American Rubber Tire Company?

A. There were but two sets from the American Rubber Tire Company; I couldn't be positive about them.

X-Q. 41. How long did those two sets last?

A. Between six and eight months.

X-Q. 42. What is the difference between the tire made by the Rubber Tire Wheel Company and those made by the American Rubber Tire Company?

1520

A. One rubber is put on and soldered on and the other is put on by a wire—the wire twisted.

X-Q. 43. Does there appear to be any difference on the outside?

A. None.

X-Q. 44. Could you tell one from the other if they didn't have the maker's name on them?

A. No, sir.

X-Q. 45. Is there any difference between the looks of the Rubber Tire Wheel Company's tires and the Standard tire?

A. Not on the outside appearance. 1521

X-Q. 46. Did you ever use any solid rubber tires of the kind known as clincher tires?

A. No.

X-Q. 47. Did you ever use any rubber tires that had a different appearance on the outside from the Rubber Tire Wheel Company's Tire?

A. Some had a darker appearance than that; some had a darker look.

X-Q. 48. Except in the color of the rubber there was no difference on the outside appearance between the tires which you have used?

1522 A. There was no difference in the outside appearance.

X-Q. 49. Do you think that these rubber tires are good things?

A. Yes, sir.

X-Q. 50. Do they save wear and tear on the carriages?

A. Yes, sir.

X-Q. 51. Do you know of any rubber tires now in use by any one which differ in outside appearance from those made by the Rubber Tire Wheel Company?

A. They all have the same appearance.

X-Q. 52. Did you ever see any rubber tires of that kind upon the market or in use before the Rubber Tire
1523 Wheel Company introduced its tire?

A. No, sir.

X-Q. 53. Did you ever see any Victor tires?

A. No, sir.

X-Q. 54. Or any Firestone Victor tires?

A. No, sir.

EDWARD F. DELANEY.

Sworn before me,

JOHN A. SHIELDS,

U. S. Com. & Spec. Examiner.

1524 Defendants' counsel here states that this deposition closes the testimony of defendant's witnesses in New York and defendants' counsel here gives notice that he will proceed with the taking of testimony in behalf of defendants in this case at the City of Chicago County of Cook and State of Illinois at Room 1228, Monadnock Block, corner of Randolph and Dearborn in said city before Frederick C. Goodwin, Esq., a Notary Public on Thursday, the 29th inst. namely December 29th, 1898, at 10 o'clock A. M. of that day and that he will examine among other witnesses at that time and place Mr. Marks.

Complainant's counsel is invited to attend and cross examine if he so desires. 1525

UNITED STATES CIRCUIT COURT NORTHERN DISTRICT OF ILLINOIS. NORTHERN DIVISION.

The Rubber Tire Wheel Company, *Complainant,*
vs.
Firestone Victor Rubber Tire Company, Thomas Clements, William Marr and Harvey S. Firestone, *Defendants.*
In Equity.
No. 24,502. 1526

United States of America, Southern District of New York, ss.

I, JOHN A. SHIELDS, United States Commissioner for the Southern District of New York, and Special Examiner by consent in the above entitled cause, do hereby certify that on the days indicated in the foregoing depositions at my office in the Post Office Building in the City of New York, I was attended by Paul A. Staley, Esq., of counsel for complainant, and Charles K. Offield Esq. of counsel for defendant and by the witnesses James W. Pitney, Samuel Lawson, William H. Seaich and Edward Francis Delaney, and the said witnesses having been by me first duly cautioned, examined and sworn to testify the truth, the whole truth and nothing but the truth in the above entitled cause gave their depositions which by consent of counsel for the respective parties was taken down by a typewriter appointed by me for that purpose, in the presence of the witnesses, and from their statements and the same having been read over to the respective witnesses, they severally subscribed and swore to the same. 1527

1528 I further certify that a notification of the time and place of taking said deposition is annexed hereto.

I further certify that the reason for taking the foregoing depositions is that the witnesses are necessary material and live more than 100 miles from the place of trial in the within entitled cause.

And I further certify that I am not of counsel nor attorney for either of the parties in the said depositions and caption named nor in any way interested in the event of the cause named in the said caption.

IN TESTIMONY WHEREOF I have hereunto subscribed
1529 my name and affixed my seal this 24th day of December, 1898.

JOHN A. SHIELDS,
United States Commissioner, Southern District of New York and Special Examiner.

[SEAL.]

[Revenue Stamp.]

1530

1531

Defendant's Exhibit Original Testimony Illinois Case No. 2.

UNITED STATES CIRCUIT COURT NORTHERN DISTRICT OF ILLINOIS NORTHERN DIVISION.

The Rubber Tire Wheel Company,
vs.
Firestone Victor Rubber Tire Company, Thomas Clements, William Marr and Harvey S. Firestone.

In Equity.

No. 24,502.

1532

MANTON MAVERICK, ESQ.,

Solicitor for Complainant.

Sir:—

Please take notice that we will take testimony on the part of the Defendants in the above entitled cause before Frederick C. Goodwin, Esq., a Notary Public in and for the County of Cook and State of Illinois, at his office, No. 1228 Monadnock Block, Chicago, Illinois, on Thursday the 3rd day of November, 1898, at 10 o'clock A. M. Said examination will continue from day to day until completed, and the witnesses to be examined will be Thomas B. Jeffery, Frank P. Stone, C. O. Harz, Walter 1533
N. Beecher, and others.

You are invited to be present and cross examine if you so desire.

OFFIELD, TOWLE & LINTHICUM,
Solicitors and of counsel for Defendants.

Copy of the above notice accepted this 1 day of November, A. D. 1898. 4–30 P. M.

MANTON MAVERICK.

1534

UNITED STATES CIRCUIT COURT NORTHERN DISTRICT OF ILLINOIS NORTHERN DIVISION.

The Rubber Tire Wheel Company *vs.* Firestone Victor Rubber Tire Company, Thomas Clements, William Marr and Harvey S. Firestone.	In Equity. No. 24,502.

At Chicago, in the Northern District of Illinois, on this 3rd day of November, A. D. 1898 at 10 o'clock A. M. before me, Frederick C. Goodwin, a Notary Public within
1535 and for Cook County, Illinois, residing at Chicago, in said District, at my office, No. 1228 Monadnock Block, Chicago, Illinois.

Present: C. K. Offield, Esq. on the part of defendants and Border Bowman, Esq. on the part of said complainant.

And thereupon the following proceedings were had pursuant to notice hereto annexed:

And thereupon defendants' counsel calls as a witness in their behalf, MR. FRANK P. STONE, who being first duly sworn to state the truth, deposes as follows
1536 in answer to interrogaories propounded by C. K. Offield, Esq.

Q. 1. Please state your name, age, residence and occupation?

A. Frank P. Stone; 44 years old; 754 Washington Boul. Chicago, Illinos; carriage builder.

Q. 2. Do you use or apply solid rubber tires to the carriage wheels built by you?

A. Yes sir.

Q. 3. For how many years have you applied rubber tires to carriage wheels in Chicago?

A. As long as the Rubber Tire Wheel Company has been in business. 1537

Q. 4. Were you one of the first patrons of the Rubber Tire Wheel Company in the purchase of rubber tires and rims, like that shown in their Grant Patent in suit, dated Feb'y. 18, 1896 and No. 554,675?

A. Yes, I think we were.

Q. 5. State approximately if you can, how extensively you have applied rubber tires to or equipped wheels with rubber tires since you first began their use several years ago? At least in comparison with other carriage manufacturers in Chicago?

1538

A. I think we are second or third on the list in extended use.

Q. 6. I will ask you to examine "Complainants Exhibit Sample of Complainant's Tire" and state whether this tire and accompanying rim represent substantially, if not exactly, the rubber tire and rim you purchased for several years of the complainant?

A. I should think it did.

Q. 7. Have you ever watched and kept track of the rubber tires of the complainants like this exhibit, to see in what manner they wore out or were destroyed in actual use in this city?

1539

Objected to as leading.

A. Yes.

Q. 8. Will you not please state in what manner or in what way these rubber tires of the complainant were worn out or destroyed before wearing out in the practical every day use of the vehicles to which you applied them.

Objected to as incompetent on the ground that if the question is intended as an attack on the utility of the tire, it is too indefinite; and further, for the reason that the record shows that the complainant's form of solid rubber tire has supplanted all other

1540 forms of tire and is almost exclusively used on vehicles to-day.

A. Some of the wires holding the rubber on to the channel tire would cut their way down through to the channel—the bottom of the channel. Some would cut through the side. I think that is all.

Q. 9. Please state a little more explicitly what you mean by Complainant's tire cutting through the side?

Objection made to the last question by consent is here made once for all to all questions and testimony as to the alleged defects or wear of the tire.

1541 A. The oscillation of the vehicle when in motion seemed to draw the rubber of the tire to either side of the channel, causing the tire to break or give away at the outer edge of the channel.

Q. 10. What proportion of complainants tires were destroyed in use in this way by cutting at the upper edge of the channel?

A. That I couldn't say.

Q. 11. Can you state whether or not such condition was of frequent occurrence in the construction of the tires?

A. Compared to the wearing down of the tires to the
1542 channel it was quite frequent.

Q. 12. Since you began the use of complainant's tire several years ago, state whether or not there has been any marked improvement in the character and composition of the rubber used in the construction of the tire?

Objected to by complainant's counsel on the ground that it is incompetent and irrelevant, and for the reason that it calls for opinion of the witness about matters as to which he is not qualified, and lastly that it is leading in its form.

A. In my judgment based upon observation, and ex-

perience, I consider the tire used to-day much superior in quality than formerly used in this country. 1543

Q. 13. What rubber tire do you use to-day?

A. We use some of the Imperial Tire Company's tire, and also the Calumet Rubber Tire Company. We use some of the complainant's tire occasionally.

Q. 14. How does the wearing quality and composition of rubber and the life of the tire of the Imperial and Calumet tires compare with the complainant's, with which you are familiar?

Objected to as incompetent and immaterial.

A. Do you refer to those now in use by the several rubber tire manufacturers? 1544

Q. 15. I referred principally to the Imperial and Calumet tires which you say you now use?

Objection repeated.

A. I do not think we have had a sufficient number of them in service for a sufficient length of time to warrant my making a comparison, but I should say off-hand I think the wear of the two, (Calumet and Imperial) would be much similar, in durability.

Q. 16. How about the Calumet and Imperial in comparison with complainant's tire as to wear?

Objection repeated. 1545

A. I am of the opinion from what experience we have had in the past, that either of these possess greater durability.

Q. 17. Do you personally know Mr. Kelley, the Manager of the Complainant?

Objected to as immaterial.

A. I believe I met him at my office upon several occasions, when he has been there.

Q. 18. Do you personally apply these rubber tires to the wheels of the carriages or vehicles?

A. We do.

1546 Q. 19. And have these rubber tired wheels during the years past come back to your place for repair or replacement, when injured or worn, as you have described?

A. Yes sir.

Q. 20. Is it not a fact Mr. Stone, that the use of these rubber tires as to increase and continuance is largely a matter of education upon the part of the carriage manufacturer?

Objected to on the ground that the question is leading.

A. I think so.

1547 Q. 21. What in your opinion as a user of these tires, is the secret of the success of the tire, such as it has so far established?

Objected to on the ground that it is incompetent and that it calls for assumption and opinion of the witness as to which he has not qualified.

A. I should say again, judging from my experience and observation that primarily essential to the life and durability of the tire, is the quality of the rubber used. That the methods of securing the rubber tire to the wheel which are multitudinous in number but of secondary consideration.

1548

Cross-Examination by Mr. Bowman.

X-Q. 22. You may state Mr. Stone how long you have been applying rubber tires. I refer to solid rubber tires.

A. It is impossible for me to fix the date when we commenced using rubber tires without referring to my books. Several years probably.

X-Q. 23. My question referred to when you began applying rubber tires yourself and did not refer to the time when you began to use them.

A. That is as I understood it, in my answer accordingly.

X-Q. 24. Then getting at it in another way, about how long did you use rubber tires or advocate them for your customers, before you began to put them on at your place of business? 1549

A. Probobaly when the complainant first brought them to our attention.

X-Q. 25. I understand from your direct examination that you now put rubber tires on vehicles at your place of business instead of sending them to rubber tire companies to have them put on. Is that not correct?

A. We do.

X-Q. 26. How long have you been doing this? 1550

A. That I couldn't state definitely.

X-Q. 27. State approximately as near as you can?

A. Possibly for several years.

X-Q. 28. What line of carriage work are you particularly engaged in as to whether it relates to fine carriage or the cheaper class of work?

A. We do only the highest class of carriages, exclusively.

X-Q. 29. What other large firms are there in Chicago building fine class of work or making a specialty of that kind of work?

A. I think we are the only ones confined exclusively to high class work. 1551

X-Q. 30. What other large firms are there who turn out fine class of work, though they may not confine themselves to that work, exclusively?

A. C. P. Kimball & Co., Studebaker Bros. Mnfg. Co., are the principal ones.

X-Q. 31. Now referring to your testimony as to putting rubber tires on at your place of business, I will ask you whether it is not true that you used almost exclusively complainant's tire from the time it was introduced

1552 upon the market until the time when you determined to have the tires put on at your place of business?

A. I think we did.

X-Q. 32. And did you not take up the Kelley, Maus rubber tire for the reason that you could make an arrangement with them about applying the tire at your place of business and for the reason that the Rubber Tire Wheel Company, the complainant, was unwilling that you should apply complainants rubber tire at your place of business?

A. No sir.

1553 X-Q. 33. Is it not true that you did endeavor to make some arrangement with complainant about having complainant's tire put on at your place of business?

A. Yes sir.

X-Q. 34. And is it not true that after complainant declined to consent to such an arrangement, that you did make an arrangement with some other concern?

A. Yes sir.

X-Q. 35. And that since that time you have advocated the tire now put on by you and have ceased to advocate to any great extent, the use of complainant's tire?

A. The question of make of tire seldom comes up
1554 with our patrons. And I do not know as any of our customers are aware of whose tire we use.

X-Q. 36. So, as I understand, the make of tire put on your customers vehicles is left almost entirely to your judgment, and that since you made the arrangement mentioned, you have had applied to these vehicles to a great extent, the rubber tires put on at your place of business.

A. Yes sir.

X-Q. 37. Can you state how many sets of solid rubber tires you purchased from complainant. If you are not able to state exactly, state as nearly as you can.

A. It would be impossible for me to give any definite 1555
information as to number of tires we put on without going through our books.

X-Q. 38. Would you say that there were more than a hundred sets or would you put it in that neighborhood?

A. I would not venture to make a statement, as that does not come under my immediate supervision.

X-Q. 39. You may state Mr. Stone whether Complainant's rubber tires that your customers have used have not given general satisfaction to the parties using them—so much so that they have continued the use of solid rubber tires?

1556

A. We have had a good deal of complaint from our customers, occasioned by the tires not holding their place in the channel, or giving out in one of several ways long before they were worn out in service and use. But the use of rubber tires is now considered such a luxury, and especially to those who desire to keep in touch with the fashion of the times, that they are retained notwithstanding.

X-Q. 40. Will you kindly give the names of some of the customers referred to in former answer.

A. I would have to refer to my books.

X-Q. 41. Can't you remember the customers who 1557
made such grave complaints or any of them?

A. I do not come in contact with the customers, but have a general supervision of the mechanical department.

X-Q. 42. So that the complaints referred to would not be made to you personally, but would come through other persons in your employ?

A. In most cases, and I might add that when the tires give out, the vehicle is sent to our place for repairs, as we expected to make them good under any and all conditions, which we are always perfectly willing to do without any controversy with our customers.

1558 X-Q. 43. You now evidently refer more particularly to rubber tires that are applied on the wheels at your place of business. Is that not correct?

A. I refer to any and all tires which we give to our customers.

X-Q. 44. Can you name any customer who has discontinued the use of solid rubber tires because of any alleged objections to them?

A. I could one.

X-Q. 45. And that is about all, is it not?

A. He had them removed and would not use them under any conditions.

1559 X-Q. 46. Who was he?

A. I cannot recall his name.

X-Q. 47. Can you state as to when he had the rubber tires applied to his vehicle?

A. He bought the cab from us with the tires on. It was an English make, but his only objection was his opposition to rubber tires, on account of their want of durability, as I recall the circumstance.

X-Q. 48. Was he a livery-man or a party who had used the vehicle as a private vehicle?

A. He bought the carriage for a special use to accom-
1560 modate certain patrons, but who would not be considered a livery-man.

X-Q. 49. Is it not true Mr. Stone that parties engaged in the business of renting out vehicles for the use of others, would naturally oppose the use of solid rubber tires on account of the expense or luxury as you have termed it?

A. I think your question is susceptible of a double answer.

X-Q. 50. Well explain the answer in a way that you deem proper.

A. I think as a matter of business, the party owning

such a carriage would exercise his judgment to determining whether it would earn more with or without rubber tires. I am aware that livery-men and cab companies have generally adopted them with this idea in view. Rubber tires at present being very popular and fashionable. 1561

X-Q. 51. Were you acquainted with the rubber tires (I refer to the forms of solid rubber tires) that were in use in the City of Chicago prior to the introduction of complainant's tire?

A. For some years prior to my knowledge of com-complainant's tire, I had made considerable inquiry into the merits of other rubber tires, used in this city and New York, as well as in England and on the Continent. We had received a number of letters from French manufacturers of tires in Paris, urging us to adopt their tire, showing illustrations of numerous methods of securing the rubber to the wheel. I made it my special endeavor on one of my trips to New York to look into the merits of the various tires then in use and the result of my investigation was that rubber tires were so expensive that they did not warrant their adoption for general use. And I may state further, I was informed by some of the leading builders that they did not possess sufficient durability to warrant the outlay. This opinion was given me by those who had had considerable experience with them in service. I refer to carriage builders. 1562 1563

X-Q. 52. Then as I understand your answer, prior to your knowledge of complainant's tire, you fore-saw the desirability of a solid rubber tire for vehicles and were sufficiently interested to investigate not only in this country, but in foreign countries, is that correct?

A. My investigations were confined to this country principally.

X-Q. 53. In your investigation in this country, what

1564 makes of solid rubber tire did you find were in use at the time you have named?

A. English makes, though I presume there were some French.

X-Q. 54. Do you remember of observing forms of tire known as the Howard M. DuBois rubber tire, the Elliott tire, the Emerson and the Boston?

A. I may know them all by the tires but not by the name. We used some of the Howard DuBois, and have considered the merits of the other makes, above mentioned.

1565 X-Q. 55. Do you know of the Elliott rubber tire as being one put on by Ferdinand French of Boston?

A. I do not know it by the name.

X-Q. 56. Were not these various forms of tires in use in Chicago as well as in New York?

A. Not to the same extent by any means.

X-Q. 57. Referring to the sample as to which you testified in your direct examination, I ask you whether that make of tire as distinguished from the tires you just named, with the sides of the channel flaring outwardly, the holes for the retaining wires below the top of the flanges, and the angle of the rubber, substantially as
1566 there shown, is not the make of solid rubber tire almost exclusively used in the city of Chicago and elsewhere, so far as your observation and knowledge goes?

A. You refer to the DuBois and Elliott tires. Will you kindly tell me what the Elliott tire is?

X-Q. 58. The Elliott tire is one with a steel band which passed through the rubber and the steel band passed on through the felloe of the wheel and was held by a clip on the bottom of the felloe?

A. I would say that the tire, sample of which you have shown me, the rubber being placed in the channel

tire secured by one or two wires, variously shaped and applied is the style generally adopted in this city. 1567

X-Q. 59. And can you state any differences from that sample you have and if so, please designate them?

A. The method of securing the tire (rubber) to the channel the shape of the channel and the shape of the rubber, and the method of securing varies in different tires which have been brought to my attention.

X-Q. 60. What tires in actual use to-day vary from this sample as to the two independent retaining wires passing around through the rubber and located below the top of the flanges of the channel iron?

1568

A. I do not know how many there are, but am familiar with several makes.

X-Q. 61. But you would say would you not that the tires in actual use to-day are substantially the wired on tire, as distinguished from the clincher form which was used in the English tire, and a steel band used in the Elliott, which was fastened to the felloe?

A. At present, I think the majority of the tires in use are confined in the channel iron by one or two wires, although a band is now being used as a substitute for the wire. To what extent I do not know.

X-Q. 62. And that band is a very recent innovation, is it not? 1569

A. I am not at all sure of that, as I have received circulars from Paris claiming the band in use there in different forms and shapes of tires, but for how long a time they have been in use I do not know. The cuts referred to above, as I recall them, have a substitute for the wire band passing through the rubber.

Complainant objects to the answer on the ground that it is irresponsive and calls the witness' attention to the fact that the questions have been directed to the actual use in the City of Chicago and

1570 New York, where he has testified as to his knowledge of the use of rubber tires.

X-Q. 63. You may state what tires of the makes that you have referred to as the English, the French, the Du Bois, and the other makes, whose names you do not remember, but which were in use to some extent at the time you made the investigation referred to. I ask which, if any of these tires are in actual use in Chicago and New York to-day?

A. I do not know.

X-Q. 64. Do you know of any of them being in actual use to-day?

1571 A. There may be some builders putting them on, but I have not taken occasion to investigate. I think more than likely the representatives of French coach builders in this country are using some of the French styles, as it would be to their interest to do so.

X-Q. 65. Do you know who applied the English or clincher tire in Chicago?

A. I am of the opinion that those used in Chicago were put on in New York by one or two parties.

X-Q. 66. What parties were those in New York?

A. Brewster & Co. Broom St. and another party,

1572 whose name I do not recall.

X-Q. 67. Was it a Mr. Walker?

A. Yes sir.

X-Q. 68. Did not C. P. Kimball & Co. put them on at their factory in the city of Chicago?

A. Not that I am aware of. That is so long ago, it may be the fact.

X-Q. 69. But at any rate, so far as your observation goes, as to the solid rubber tires that you see in actual use in Chicago, these makes existing at the time you investigated are not now in actual use. Is that not correct?

A. That is right. That is, they are not in general use. 1573

Re-Direct Examination by C. K. Offield, Esq.

R-D. Q. 70. Do these rubber tires of the complainant's and all the rubber tires in the market sell to the trade and by the trade to the customers or users by the pair or by the pound or how?

Objected to as not proper re-direct, and on the ground that it is immaterial.

A. Most of the rubber tire manufacturers sell them at a list price per set, giving a discount to the trade.

R-D. Q. 71. Do you know whether the quantity of rubber put in the sets make any difference in the price of the tires? 1574

A. Where they are sold by the pound, certainly, but where they are sold by the list price, I do not know whether the manufacturers take that into consideration or not.

F. P. STONE.

Subscribed and sworn to before me, this 3rd day of November, A. D. 1898.

FREDERICK C. GOODWIN,
Notary Public.

[SEAL.]

1575

Adjourned to Friday, Nov. 4, 1898, 10 o'clock A. M.

Friday, Nov. 4, 1898, 10 o'clock A. M. parties met pursuant to adjournment. Present: Same as before.

And thereupon defendants counsel calls as a witness MR. C. O. HARZ, who being first duly sworn, deposes as follows in answer to interrogatories propounded to him by C. K. Offield, Esq.

Q. 1. Please state your name, age, residence and occupation.

1576 A. C. O. Harz; age 43; residence, 502 Dearborn Ave. Chicago; livery and cab and boarding stables.

Q. 2. How long have you been engaged in that business in the City of Chicago?

A. Nine years.

Q. 3. How does your business compare in volume and value with other and your competitors in the same line?

A. I do about as large a business as any of them I think; of course, there may be one or two of them that do as much but I am inclined to believe that I do a little more than any one of the others here in the City.

1577 Q. 4. Do you equip your cabs or buggies with rubber tires or have them so equipped?

A. Yes.

Q. 5. How long have you used these rubber tired vehicles in your business in this city.

A. Without consulting my books, it must be 4 years ago since I first started.

Q. 6. How many cabs or vehicles at the present time have you equipped with solid rubber tires and in use.

A. About 80. I didn't equip all of those 80 myself, but bought some of them with the tires on.

Q. 7. Have you for the last four years used a tire on
1578 your cabs made by the Rubber Tire Wheel Company, who is the complainant in this case?

A. Yes. It was sold to me by them, so I suppose it was made by them.

Q. 8. Is this sample which I now show you marked "Complainants Exhibit Sample of Complainants Tire," substantially the tire and rim sold by you by the complainants during the last four years?

A. I judge it to be the same.

Q. 9. Has any other livery-man or cab renting establishment in this city to your knowledge used or applied

rubber tires to their vehicles during that time, more ex- 1579
tensively than yourself?

A. I think not.

Q. 10. Can you state approximately at least, Mr. Harz, the number of rubber tires that you have used either through purchase or application upon your cabs in this city during the last four years?

A. I should judge it must be between 200 and 250 sets.

Q. 11. During the last four years have these complainants tires worn out in the sense of being rendered useless by wear in distinction from being destroyed or 1580
made worthless in some other manner before being worn out.

Complainants counsel renews the objections made to Qs. 8 and 9 in the testimony of Frank P. Stone, which objections by consent of counsel are to apply to all testimony as to any attacks on the utility of complainants form of tires, once for all.

A. My argument to the people has always been that I am not wearing out your tires, but just throwing them away, for the reason that they didn't wear out on top but were continually tearing out underneath and on the sides, which according to their promise or verbal guarantee to 1581
me, should not be.

Q. 12. What promise or verbal guarantee did the complainants make to you as to this matter when you first began purchasing and using their tires like the exhibit sample some four years ago?

Objections repeated and for the reason that the question calls for hearsay evidence, and is immaterial. These objections by consent of counsel made once for all to this class of evidence.

A. Why Mr. Anthony at that time, their Western Manager, and Mr. Cushing their solicitor, both told me

1582 repeatedly that any tire that I would purchase from them, if the same would tear out underneath or on the sides, they would replace by a new tire, free of charge to me.

Q. 13. Did they do this and keep their promise. What is the fact?

A. In a number of cases they did. In the early part when we first started to use them, they did. In some cases they would put on tire new and later on they began to patch them and refused to put on new tires, unless we paid for them.

Q. 14. Have you ever in a single instance had one of the complainants tires like this sample exhibit destroyed
1583 or made useless by the wearing out of the rubber in use, instead of the tire being destroyed by cutting out at the sides or through at the bottom?

A. I have. One set that wore out from the top of the rubber wearing down to the lever with the channel, until the wire was exposed.

Q. 15. Is this the only instance you have ever known of complainants tire wearing out instead of being destroyed by cutting or tearing, as you have described?

A. The only one to my knowledge. The only one in my establishment.

1584 Q. 16. Please look at the two coils of material now shown you and state what they are.

A. Why they are rubber tires similar to some that were taken off of my wheels. I wouldn't undertake to say they are the same ones.

Q. 17. Are they the same kind of tire to all appearances furnished by the complainant to you?

Objected to as leading.

A. Yes.

Q. 18. I call your attention to the condition of these tires and ask you if such tires represent substantially the cut and torn condition of the complainant's tires that you

have used and had removed from your cab wheels during the last four years, as you have described? 1585

Objected to on account that it calls for secondary evidence, the tires themselves being the best evidence as to their condition; and further, for the reason that counsel is not informed whether these coils are to be introduced or not in evidence.

A. Yes they do.

Q. 19. What is your best judgment or recollection as to whether these two particular tires come off of your wheels?

Objected to on the ground that it has already been answered. 1586

A. I couldn't state whether they came off of my wheels or not.

Q. 20. During the last four years have you noticed whether or not the quality and character of the rubber has varied any in the tires furnished you by the complainant?

Complainant's counsel renews the objections made to Q. 12 of Frank P. Stone's testimony, which objections by consent were to apply to all this class of testimony.

A. Not being a judge of rubber my argument with the Rubber Tire Wheel Company's representative here, has always been that there is either a defect in the material used or in their workmanship of putting the tires on the channels. 1587

Q. 21. What has the Rubber Tire Wheel Company always claimed to you to be the character of the rubber and material used by them in their tires?

Objected to as immaterial and incompetent.

A. They always claimed to use the best of material.

Defendants counsel here offers in evidence the two tires identified by the witness and requests that they

1588 may be marked "Defendants Exhibit Complainants Commonly Cut Tire."

Complainants counsel object to the introduction in evidence of the two tires on the grounds heretofore stated to the estimony concerning same, and for the reason that they have not been properly identified.

Cross-Examination by Mr. Bowmann.

X-Q. 22. You may state Mr. Harz whether you are familiar with the solid rubber tires in public use in Chi-
1589 cago?

A. I am familiar with them in this manner, that I have used them for the last four years and see others use them.

X-Q. 23. I now hand you a cross section showing a channel iron with a rubber with the sides of the channel flaring and other features, and ask you whether that does not represent the solid rubber tire in use in the city of Chicago at the present time, so far as you are familiar with the said solid rubber tires?

A. It looks to be about the same.

1590 Complainants counsel asks the notary to mark the cross section referred to as "Complainants Exhibit Sample of Modern Form of Wired-on Solid Rubber Tires."

X-Q. 24. Wsre you familiar with the forms of solid rubber tire that were in use in Chicago before complainant introduced its solid rubber tire in this city?

A. No, with one exception. There was one set of another make in my use before that.

X-Q. 25. Do you know the name of that make?

A. I was told that it was an imported English tire.

X-Q. 26. Was it a clincher form of tire—that is, the rubber held in by the flanges clinching the rubber? 1591

A. It was a tire—a solid rubber tire on a similar channel to the one used by the Rubber Tire Wheel Company.

X-Q. 27. Has not that form of tire gone out of use in the city of Chicago?

A. That particular make? I couldn't say. This is the only set I ever had of that particular make. I don't know whether anybody else used that tire here or not. It was shipped here from Boston on the wheels. It was shipped by D. P. Nichols & Company.

X-Q. 28. Are you still using this modern form of solid rubber tire, wired on the channel iron, attached to the felloe of the wheel? 1592

A. I am.

X-Q. 29. Is it not true Mr. Harz that you have had some trouble with complainant about the payment of accounts due them for solid rubber tires?

A. I had a dispute with the Rubber Tire Wheel Company which arose from the dispute in regard to some wheels which I was compelled to take from them, as they refused to repair as I requested them.

X-Q. 30. And you refused to pay your account, did you not? 1593

A. Yes sir.

X-Q. 31. You remember how much you owed them?

A. It was in the neighborhood of $400. May be a little less or more.

X-Q. 32. Was this amount represented by notes due at different times?

A. No sir, if I had, it would have been settled.

X-Q. 33. Did not the Company hold your notes for various sums?

A. Yes sir.

1594 X-Q. 34. And have they not sued you for the money that is due them on these notes?

A. They have.

X-Q. 35. And did you not endeavor to continue with the Rubber Tire Wheel Company by offering to give them notes for the purchase price of rubber tires that you wished to buy?

A. Not for any new work, as I was having my new work done elsewhere at the time. That is, for about four weeks previous. They refused to make good their own tires that were causing us a great deal of trouble.

1595 X-Q. 36. From whom did you get your new work?

A. From the Firestone Tire Company. They were repairing my old work, which the other Company refused to do.

X-Q. 37. That Company is the Firestone-Victor Rubber Tire Company, defendant in this case, is it not?

A. Yes sir.

X-Q. 38. And you are still a customer of this Firestone-Victor Rubber Tire Company?

A. Yes.

Re-Direct Examination by Mr. Offield.

1596 R-D. Q. 39. Is it not a fact that all of the other old customers of the complainant, the Rubber Tire Wheel Company, are also refusing to pay the bills and charges of that Company for the failure of that Company to keep its promises, representations and verbal guarantees as to the non-cutting of their tires and the destruction thereby in use?

Complainants counsel objects to the question as improper re-direct, for the reason that the question is grossly leading in form and that same is aimed to call from the witness, matters that are clearly hearsay evidence.

A. I understand that there are several refusing to 1597
settle up for that reason.

R-D. Q. 40. Is it not a fact also that all of the liverymen and customers of the complainant in this city have just the same trouble and experience with the complainants tire that you have set forth in detail in your deposition?

Objections of complainant's counsel here repeated.

A. Yes, from what I hear of these different liverymen.

C. O. HARZ.

Subscribed and sworn to before me, this 4th day of 1598
November, A. D. 1898.

FREDERICK C. GOODWIN,
Notary Public.

[SEAL.]

And thereupon defendants counsel calls Mr. WILLIAM S. ADAMS, who being first duly sworn, deposes as follows in answer to interrogatories propounded to him by C. K. Offield, Esq.

Q. 1. Please state your name, age, residence and occupation.

A. William S. Adams; 45 years old; 4345 Lake Ave., 1599
Chicago; livery business.

Q. 2. Where is your livery plant in this city?

A. 171 and 173 41rd St.

Q. 3. How long have you been in that business in Chicago?

A. Eleven years.

Q. 4. Your business is the renting of cabs and carriages and the boarding of private cabs?

A. Yes, sir. Private vehicles.

Q. 5. For the last four or five years how is your business compared in extent to the principal livery-men of the city?

1600 A. Comparatively speaking I think we average about the largest that is done at any one stable on the South side.

Q. 6. How many cabs or vehicles have you in your charge or control at your stables?

A. In the summer time we have about 70 boarders; and in the Winter they run down to between 40 and 50 —it varies. Of our own we run about 26 vehicles.

Q. 7. Are your cabs and vehicles equipped with solid rubber tires?

A. We use the solid rubber tire.

1601 Q. 8. How many of the cabs or vehicles that you have charge of as boarders?

A. I would say in the neighborhood of 40.

Q. 9. When and under what circumstances did you first begin equipping your vehicles with solid rubber tires?

A. If I remember correctly, it was the Fall after the World's Fair. It was a matter which we had given much thought to and Mr. Cushing of the Rubber Tire Wheel Co. came to us and gave us his tire and showed us the features of it and as there were no livery men that we knew of that were using it, we wanted to be the first in the field and we made a bargain with him and put on

1602 three sets to begin with on three broughams that same Winter.

Q. 10. How many sets of the complainant's tire—I mean the Rubber Tire Wheel Company—have you put on or used or had in your establishment counting your boarders, since the Fall of 1894?

A. Well I should say in the neighborhood of 75 to 80 sets.

Q. 11. What is the reason that you ever take off the complainants tires and put on new tires in their stead—what happens to the tire that necessitates substituting new tires therefor?

Objected to for the reasons heretofore stated in Mr. Stone's testimony, and further on the ground that the question is leading. 1603

A. There is the natural wear out of the tire and when I examine my tires—don't suppose there is a week but what I go through my vehicles and examine the wheels, I look along the flange of my tire—see that there is any tearing out and of course if I see that the tire is a little torn I examine the tire close and if I find that it has had the wear and shows that it is worn out, why then I have to send it down and have a new tire put on.

Q. 12. What do you mean by the tire being worn out that you so discover upon this examination? 1604

A. A tire may appear to have rolling surface but still it may be torn out on the sides. You can see the wires through the sides of the tire along the flange and other times with this tearing out on the flange, it may be worn out on the under surface.

Q. 13. Then as I understand you, when you examine your tires and find that they are cut along the flange and are cut next to the channel and under surface, they are worn out as you understand and you substitute new tires therefor?

A. Yes sir. 1605

Q. 14. Please look at this section of tire now shown you—that is marked "Complainants Exhibit Sample of Complainants Tire" and state whether or not this is a representation and is in fact a part of such tires and rims as you have bought of the complainant for several years past, as you have described?

A. I couldn't tell from observation. I don't think one tire from another. I have seen several solid rubber tires of different companies and they look very similar to me.

Q. 15. Mr. Adams, have you ever had in your pos-

1606 session or use, any of complainants solid rubber tires that wore out, as you term it, or were destroyed in any other way in use than by such tires tearing out along the side of the flange or tearing out through the holes at the bottom?

Complainant's counsel renews the objections made to Qs. 8 and 9 of the testimony of Frank P. Stone which objections by consent were to apply to all testimony concerning any attempt on the part of defendant to attack the utility of the tire.

A. We had an experience with three landaus in three
1607 months use the tires were sound at the sides and tore out on the bottoms.

Q. 16. But all of the rest of the tires as I understand you then tore or cut out along the sides?

Objected to in its present form on the ground that it is leading and assumes what the witness had not stated to be the fact.

A. When worn out. I never saw but one set of tires that was worn out on the surface, during my experience. That was a brougham. That the bearing surface was worn right down and all the wear of that tire was shown on the surface and nowhere else.

1608 Q. 17. Please look at the tire which I now show you and state whether or not you recognize it as one of the tires used upon your cabs or vehicles, and worn out thereby, as you have termed?

A. I couldn't swear that that was my tire.

Q. 18. Please examine that tire carefully and state whether or not it represents the wearing out by cutting along the sides, as you have described the destruction of complainants tires in that manner used by you.

Objections which by consent were applied to this testimony repeated, and further, on the ground that it is secondary evidence.

A. I have seen a number of sets worn out very similar 1609
to this tire—that is a number of wheels. We take off one wheel sometimes.

Q. 19. And whenever in your examination of the wheels of your cabs or vehicles, you find a pair that is cut at the sides in the way shown by this tire you have in your hand, you say it is worn out and you take it off and put on a new tire do you?

A. Yes sir.

Defendants counsel here offers in evidence the tire identified by the witness and requests that the same may be marked "Defendants Exhibit Complainants 1610
Adams Cut Tire".

Complainants counsel objects to the introduction in evidence of this exhibit on all the grounds heretofore stated, which by consent were to apply once for all, and further on the ground that the exhibit has not been properly identified.

Q. 20. Mr. Adams, have you had some little difficulty or dispute with the complainant about paying for tires that cut and destroyed themselves on the rims without wearing out?

A. Yes sir. 1611

Cross-Examination by Mr. Boxmann.

X-Q. 21. It is true is it not that complainant, Rubber Tire Wheel Company, threatened to sue if your account was not paid?

A. Mr. Kelley's agent threatened to sue me Monday morning if the account wasn't settled. I mentioned the fact to my brother. He asked me how I happened to be talking with this agent. I told him that I referred to the three landaus and he got very angry and told me if that account wasn't settled by Monday morning that he would bring suit. My brother said we will wait until

1612 Wednesday morning and see if he will bring suit. That happened in May and they never asked us for the money. We voluntarily paid it in July.

X-Q. 22. I understand that you still use solid rubber tires do you not Mr. Adams?

A. Yes sir.

X-Q. 23. How many vehicles have you in use upon which solid rubber tires are applied to the wheels?

A. Of our own?

X-Q. 24. Of your own and your customers.

A. About 40 boarders; and from 23 to 26 of our own.

1613

X-Q. 25. How many vehicles have you of your own on which you do not use solid rubber tires?

A. Two baggage wagons.

X-Q. 26. By baggage wagons you mean wagons which are intended principally for hauling baggage?

A. Trunks to and from depots.

X-Q. 27. What make of solid rubber tire do you now purchase for your own use and recommend for the use of your customers.

A. We don't influence our customers, to any particular tire. For re-rubbering, we have used the Firestone

1614 Victor this Summer.

X-Q. 28. Have you had occasion to purchase any new sets of rubber tires—solid rubber tires—since last Summer?

A. One set. Flanges and rubber tires.

X-Q. 29. And whose make was that?

A. Firestone Victor Rubber Tire.

X-Q. 30. Were you acquainted with any of the rubber tires in use in the city of Chicago before complainant introduced its solid rubber tire?

A. No sir.

X-Q. 31. Did you know of any that were used?

A. Not familiar enough to know the make of them. 1615
Had seen the old English tire—cemented.

X-Q. 32. Then I understand that you had seen what was known as the English tire in use in Chicago but do not understand whether there were any others you had seen? Kindly state whether you had ever seen any other form of solid rubber tire before complainants tire was put on the market besides the English?

A. About the same time or a little previous to Mr. Cushing coming to me with his proposition, I had seen samples of rubber tires in about the shape of that sample. Witness referring to "Complainants Exhibit Sample of Complainants Tire." 1616

X-Q. 33. Do you ever see that English tire in use today?

A. I haven't noticed it lately within the last two or three years.

Re-Direct Examination by Mr. Offield.

R-D. Q. 34. What class of cab or vehicle service do you furnish. I mean as to prices charged and cab equipment?

A. We use the Hansom Cab; one horse brougham; two horse extension brougham; landaus and victorias.

R-D. Q. 35. I meant further to inquire whether your 1617
service is of the cheaper or higher grade.

Objected to as improper re-direct.

A. Our service is first class service. All our orders come through our office. We have no rigs that stand on the street.

WILLIAM S ADAMS.

Subscribed and sworn to before me, this 4th day of November, A. D. 1898.

FREDERICK C. GOODWIN,
[SEAL.] Notary Public.

Adjourned to Thursday, Nov. 10, 1898, 10 o'clock A. M.

1618 Thursday, Nov. 10, 1898, 10 o'clock A. M. parties met pursuant to adjournment Present: Same as before.

And thereupon defendants counsel calls MR. CHARLES F. KIMBALL, who being first duly sworn, deposes and states in answer to interrogatories propounded to him by C. K. Offield, Esq., as follows:

Q. 1. Please state your name, age, residence and occupation?

A. Charles F. Kimball; age 44; carriage builder;
1619 Chicago.

Q. 2. Where is your place of business in Chicago and how long have you been engaged in the carriage business in this city?

A. 315 Michigan Ave. and I have been in the business 22 years.

Q. 3. Are you one of the largest wholesale carriage dealers in the West?

A. I am one of the largest retail dealers. We never wholesale.

Q. 4. Are you familiar with solid rubber tires as used upon vehicles in your business?

1620 A. Yes sir.

Q. 5. How long have you applied or equipped any of your carriages with rubber tires?

A. About eleven years.

Q. 6. Have you used and if so, how extensively, the rubber tires manufactured by the complainant in this case, The Rubber Tire Wheel Company, a section of which tire I now show you, marked "Complainants Exhibit Sample of Complainants Tire."

A. We have used many hundred sets of them during the past four years.

Q. 7. In comparison with the largest and most exten-

sive use of such tires in this city by other parties,—how 1621
does your use compare?

A. My answer to that would have to be hearsay. About double to that of any one else in the city.

Q. 8. Mr. Kimball, will you now please state what are the reasons or causes that arise which make it necessary for you to take off or replace the rubber tires of the complainant?

Complainants counsel objects to the question on the ground that it calls for an assumption or opinion of the witness, as to which he has not qualified; and further, on all the grounds heretofore set forth in 1622
the testimony of Frank P. Stone, at Q. 8, which by consent is to apply once for all to this class of testimony. Further, on the ground that it is leading.

A. The English tire which we formerly used being vulcanized to quite an extent, wore down to the face of the flanges. On the present patterns of tires, the wires after a certain amount of service, either cut through the rubber sidewise or toward the steel channel before the face of the rubber is worn to the flanges, thus necessitating renewal of the rubbers.

Q. 9. Have you ever known a single instance in the use of complainants tire, where the tire was not destroyed 1623
by cutting out at the sides or bottom before it was materially injured by wear on its tread or surface in use?

Objections repeated and on the ground that it is leading.

A. So far as my experience goes, all rubber tires held by wires require the renewal from cutting of the wires through the rubber, before the rubber wears down even with the face of the metal flanges.

Q. 10. Have you ever known an instance where complainants tire has been worn out in use in distinction from being destroyed by cutting at the sides or bottom?

1624 A. We put on hundred of sets of tires that I do not see personally, but from those that have come under my personal observation, the wires have always cut through before the rubber wears down even with the metal flanges.

Q. 11. Have you noticed as a carriage manufacturer any difference in the character or composition of material in complainants tire since you began using it some four years ago?

Question objected to on the ground that it calls for an opinion as to rubber or the composition of rubber about which witness has not qualified as an expert.

1625

A. I have not noticed any change in the quality of their rubber.

Q. 12. What has the quality of the rubber to do, as far as your experience goes, with the utility and effectiveness of the tire?

Complainants counsel renews its objection to the question on the ground that it calls for expert opinion or assumptions of the witness, which objection is made once for all, by consent.

A. In my opinion it has everything to do with it.
1626 Years ago, in using the English tire, which was vulcanized to quite an extent, the rubber would wear away quickly and we did not get the good results that had been obtained from the rubber tire which we have used during the past four years.

Q. 13. Please look at the tire already in evidence in this case and marked "Defendants Exhibit Complainant Adams Cut Tire" and state whether this tire is cut in the manner described by you as constituting the destruction of the tire before it was worn out?

Complainants counsel objects to the question on

the grounds stated in its objection to the introduction in evidence of this exhibit. 1627

A. It has the same general appearance as tires that are cut through.

Cross-Examination by Mr. Bowman.

X-Q. 14. Mr. Kimball you have referred to an English tire. Was this not a form of clincher tire?

A. That word is not one I would use in that connection. It was a tire composed of rubber considerably vulcanized without wires as are at present used and the flange of such shape being narrowed at the top held the base of the rubber in place. 1628

X-Q. 15. That is, the flanges of the channel iron being bent in, instead of outwardly, clinched the rubber. Is not that right?

A. Yes sir.

X-Q. 16. You will kindly state as fully as you can, your recollection as to this particular form of tire referred as English, naming the patent by which it was known and how you came to adopt it?

A. In the Winter of 1886 and '87 I was in London and my attention was called by London carriage builders to a rubber tire they were just putting on to a limited extent known as the "noiseless tire," and as I recollect the full name of the Company owning the Patents was the Shrewsbury and Talbot Noiseless Tyre and Cab Company, Battersea Bridge, London. After trying this tire in an experimental way, I made arrangements in 1887 for its use and from that time on used it quite extensively until about 1894, when we discarded this tire in favor of the tire manufactured by The Rubber Tire Wheel Company. 1629

X-Q. 17. You may state more fully as to what ar-

1630 rangement you have had with the Shrewsbury & Talbot Company for the use of this tire, as to your means for putting it on here, and as to any rights you had in the sale of this tire?

A. We purchased from them a machine for pressing the rubber into the metal flanges; we also purchased from them the steel channels of peculiar form. I do not recall at this time the details with reference to territory covered, etc.

X-Q. 18. Then I understand from your answer that you supplied yourself with the means of applying this
1631 tire to vehicle wheels at your place of business in Chicago?

A. Yes, sir.

X-Q. 19. And you made some considerable investigation as to the merits of the solid rubber tire that were then known to be on the market, did you not?

A. What time do you refer to?

X-Q. 20. The time you referred to in 1887 or thereabouts?

A. I did.

X-Q. 21. Did you not investigate as to a rubber tire used in France and known as a French tire? Please
1632 state the name of that tire, if you investigated it.

A. I suppose you refer to the tire sold by Chicot of Paris, which I investigated in 1889 and imported and used a few trial sets.

X-Q. 22. Did you before the introduction of the Rubber Tire Wheel Company tire, investigate a tire made by Howard M. DuBois of Philadelphia?

A. DuBois has at different times had several Patents of tires, the particular one which we made a trial of consisted of two plates of steel with rubber between them the rubber being compressed and the outer plate of steel coming in contact with the ground.

X-Q. 23. Then as I understand your testimony you 1633
did not feel satisfied with the English tire, but realizing the field there was for a solid rubber tire for carriage use, investigated other makes of tires in order to get the one which would give your customers satisfaction, is that not correct?

A. That is correct.

X-Q. 24. Was it not true Mr. Kimball that your experience with the English solid rubber tire satisfied you that you could never guarantee that that tire would not pull out of the channels with the ordinary service of a private carriage?

1634

A. We did not have so much trouble with the rubber in the English tire pulling out of the channel as we had from the constant cutting of the rubber, owing to the fact that this English rubber was elongated when pressed into the channel in place of being offset as on most of the tires now in use, and also from the fact that the rubber was vulcanized to such an extent that it wore away very quickly.

Complainant's Counsel objects to the answer as being largely irresponsive.

X-Q. 25. But, in your answer to Q. 4 in your testi- 1635
mony in the case of The Rubber Tire Wheel Company against the Columbia Pneumatic Company, in which Mr. Stapleton represented Defendants, you did state as follows, did you not: "We could never guarantee that the Shrewsbury & Talbot tire would not pull out of the channels, or that in ordinary service on a private carriage that the duration of its life would be over six to twelve months"?

A. That is correct.

X-Q. 26. Referring now to the sample of rubber tire marked "Complainant's Exhibit Sample of Modern Form of Wired On Solid Rubber Tire." I will ask you to state

1636 from your observation what the effect was of the introduction of this tire upon the use of the tires you have mentioned and known as the English DuBois, Chicot and others?

A. This form of tire rapidly superseded all others.

X-Q. 27. You may state as nearly as you can about how many sets of solid rubber tires of Complainant's make you have used?

A. I cannot answer this positively without reference to the books of C. B. Kimball & Company, but should say approximately a thousand sets.

1637 X-Q. 28. What should you say as to the duration or type of Complainant's tire as shown by your customers use? I mean by that how many years would they wear.

A. It is impossible to state time definitely in reply to a question of this kind, for while we know that Complainant's tire was far superior to the English which we formerly used, yet much depends on the rubber, amount and kind of use. I saw yesterday a business buggy belonging to the Goodrich Transportation Company fitted with Complainant's tires about February of this year, where the wires had cut through and the tires were in exceedingly bad condition, while on my own buggy which has
1638 only occasional use in pleasant weather, I have a set of Complainant's tires that have been on for two years or more and are in good condition.

X-Q. 29. But referring to your answer to Q. 7 in your former testimony, where you were asked this question "Q. 7. From your experience with the use of the rubber tire made by The Rubber Tire Wheel Company what would you say as to the average life of that tire when used on a vehicle in the City of Chicago" and your answer "A. When used on the class of vehicles that we sell the average life is from two to three years. We find on rubber tires as on steel ones that owing to the difference in

diameter of the front and rear wheels on heavy carriages 1639
that the front tires whether of hard rubber or the old-fashioned steel tire need replacement in about two-thirds of the time required for the rear wheel." That is as you stated it, is it not?

A. That is correct.

X-Q. 30. Now, referring again to this exhibit "Sample Modern Form of Wired On Solid Rubber Tire" introduced by Complainant, this form of tire is almost exclusively used today in the City of Chicago, and other cities, is it not?

A. So far as my knowledge goes this general form of 1640
tire is the one now principally used.

X-Q. 31. You may state Mr. Kimball whether your Company still has solid rubber tires applied to its customers vehicles?

A. It is a rare thing for us now to turn out a vehicle without them.

X-Q. 32. Do you now purchase from Complainant or from other Companies?

A. We purchase some from Complainant and some from other Companies.

X-Q. 33. Referring again to the English tire, which you have mentioned, it is true, is it not that you are able 1641
to put that tire on your customers carriages at a greater profit to yourself than by having the Rubber Tire Wheel Company put its solid rubber tire on, but in spite of this you abandoned that English tire and would not recommend it to your customers, is that not correct?

A. That is correct.

Re-Direct Examination by Mr. Offield.

R-D. Q. 34. What did you get per set for putting on the English tires on the same wheels as to sizes that you afterwards put on the Complainant's tire?

1642 A. We only used the English tire in the heavy sizes, as the channels were too heavy and not adapted for light vehicles—principally one and one-half inch sizes. Our price for that size was $100.00 the English make, and of the make we are now using $85.00

R-D. Q. 35. Where did you have to purchase the English rubber tire?

A. We purchased the channels in England, the rubber we got in this country, some from the Revere Rubber Company, some from the New York Belting & Packing Company, some from B. F. Goodrich Company.

1643 R-D. Q. 36. How long was the life time of these English rubber tires, used in the manner as you have described with relation to your use of your personal vehicle with Complainant's tire?

Objected to as incompetent and immaterial.

A. My personal use of a vehicle is so light that I could answer it for average use. On the average the English tire wore from six months to a year.

Re-Cross Examination by Mr. Bowman.

R-X Q. 37. Assuming that you should sell the English tire at the same price that you say Complainant's
1644 sold for, $85.00, the profit to you would be greater in the sale of this English tire than the profit in your selling Complainant's tire. I refer, of course, to the size you have referred to.

A. It would be a very trifling difference in those figures.

CHARLES F. KIMBALL.

Subscribed and sworn to before me this 10th day of November, 1898.

FREDERICK C. GOODWIN,
[SEAL.] Notary Public.

Recess until 2 P. M.

1645

Met pursuant to adjournment at 2 P. M. Parties present as before.

And thereupon defendants counsel calls MR. RICHARD E. MYERS, who being first duly sworn, deposes as follows in answer to interrogatories propounded to him by C. K. Offield, Esq.:

Q. 1. Please state your name, age, residence and occupation?

A. Richard E. Myers; 23 years and a half; 859 W. North Ave. Chicago; in the employment of the Firestone Rubber Tire Company.

1646

Q. 2. What are your principal duties under such employment?

A. Applying the rubber on the wheels.

Q. 3. How long have you been with the defendant company?

A. A little over three years.

Q. 4. At their store or factory in Chicago?

A. Their store in Chicago.

Q. 5. Do you know Mr. C. O. Harz, the liveryman of this city?

A. Only by sight.

1647

Q. 6. Did the defendant ever take off his set of old rubber tires and put on a set of new rubber tires in their place for Mr. Harz, if you know?

A. Yes, sir.

Q. 7. Please look at this rubber tire, which I now show you, and which is marked "Defendants Exhibit Complainants Commonly Cut Tire" and state if you know where that tire came from?

Complainant renews its objections heretofore made to the introduction in evidence of this exhibit as set forth in C. O. Harz' testimony, page 22, which

1648 by consent is to apply once for all to this class of testimony.

A. From Mr. Harz' wheel put on by the Rubber Tire Wheel Company.

Q. 8. How do you know that this pair was taken from one of Mr. Harz' wheels?

A. By having Mr. Harz' name on it and our number from the office.

Q. 9. Do you mean by having Mr. Harz' name on the tag?

A. On the wheel. Mr. Harz' name was on the wheel.

1649 Q. 10. Who personally took this tire from Mr. Harz' wheel?

A. I did.

Q. 11. When?

A. It is on the tag. I don't remember it. We have it here on the tag the 29th of July, 1898.

Q. 12. Did you put that tag on the tire when you took it off?

A. I did.

Q. 13. Is that your writing on the tag?

A. No, sir.

Q. 14. How do you know that this tire is the tire of
1650 the complainant, the Rubber Tire Wheel Company?

A. Why by the shape and the way the rubber feels to me and the wire taken from the tire.

Q. 15. Do you Mr. Wm. S. Adams, a south side liveryman of this city?

A. Only by sight.

Q. 16. Did you ever take off any cut or destroyed tires of the Rubber Tire Wheel Company from any of Mr. Adams' rigs, as an employe of the defendant?

Objections repeated which were originally made to Frank P. Stone's testimony at Q. 8, which by consent shall apply to all this class of testimony.

A. I have, a few of them. 1651

Q. 17. Will you now please look at a tire shown you, marked "Defendants Exhibit Complainants Adams Cut Tire" and state whether that is one of those tires of Complainants, that you have taken off from the Adams rigs as you have described.

Objections repeated which were made to the introduction in evidence of said exhibit in William S. Adams' testimony, p. 30.

A. It is.

Q. 18. When did you take that tire off?

A. I marked the date on when I took it off, but I don't remember it now. The mark on the tag is Nov. 2, 1898. 1652

Q. 19. Is that your best recollection?

A. I marked the tires the day when I took them off, but I don't remember.

Cross-Examination by Mr. Bowman.

X-Q. 20. Referring to the Exhibit marked C. O. Harz —how long was this in your possession?

A. I do not know. Unless I refer to the date marked on the tag.

X-Q. 21. Then, after taking the tire from Mr. Harz' vehicle, you did not keep it in your possession? 1653

A. It was in the possession of my employer.

X-Q. 22. And are you able to tell from the rubber that it was taken from Mr. Harz' vehicle, excepting by referring to the paper tag which has the name C. O. Harz on it?

A. I can without referring to the tag.

X-Q. 23. How can you without referring to the tag?

A. By taking off a good many of them, by getting familiar with the rubber.

X-Q. 24. You mean that that enables you to tell that

1654 the tire was put on by the Rubber Tire Wheel Company, do you not?

A. Yes, sir.

X-Q. 25. Now you do not pretend to say that you can tell in any way excepting by referring to the paper tag, that that particular rubber was on a vehicle of Mr. Harz?

A. No, sir.

X-Q. 26. And that is true of the other exhibit is it not?

A. I would not know that it belonged to Mr. Adams' wheel, unless I referred to the tag.

1655 X-Q. 27. And you have not kept this in your possession, have you?

A. In my employer's possession.

R. E. MYERS.

Subscribed and sworn to before me this 10th day of November, A. D. 1898.

FREDERICK C. GOODWIN,

[SEAL.] Notary Public.

And thereupon defendants counsel calls MR. PETER J. KONZ, who being duly sworn, deposes as follows in answer to interrogatories propounded to him by

1656 C. K. Offield, Esq.:

Q. 1. Please state your name, age, residence and occupation?

A. Peter J. Konz; 21; 169 N. Humboldt St. Chicago; working for the defendant.

Q. 2. At their store in Chicago?

A. Yes, sir.

Q. 3. How long have you been working for them?

A. A year and a half.

Q. 4. Did you ever take a rubber tire off of a wheel of a livery-man, Mr. C. O. Harz of Chicago?

Objections repeated.

A. Yes, sir. 1657

Q. 5. About when was that?

A. You will find the date on the tag—October 6, 1898.

Q. 6. Is this the tire marked "Defendants Exhibit Complainants Commonly Cut Tire" that you took off of this Harz rig that I now show you?

A. Yes, sir.

Q. 7. Did you take it off personally?

A. Yes, sir.

Q. 8. Did you tie the tag on it when you took it off?

Objections repeated.

A. Yes, sir. 1658

Cross-Examination by Mr. Boxmann.

X-Q. 9. You have not kept this tire in your possession since the 6th of October, have you?

A. That was in with the rest of the rubber tires.

X-Q. 10. And they have not been in your possession all the time have they?

A. Since the 6th of October.

X-Q. 11. But did not your employer take this rubber after you claim you took it off the wheels of Mr. Harz' vehicle?

A. It was kept at the Firestone Rubber Tire Com- 1659
pany.

X-Q. 12. The only way you can tell that it is Harz' tire, is by referring to the paper tag?

A. By the tags Mr. Harz had on the wheel, the street number and barns.

PETER J. KONZ.

Subscribed and sworn to before me this 10th day of November, A. D. 1898.

FREDERICK C. GOODWIN,
Notary Public.

[SEAL.]

Adjourned to Friday, Nov. 11, 1898, 10:30 o'clock A. M.

1660

Friday, November 11, 11:15 o'clock A. M.
Parties met pursuant to adjournment.
Present: Same as before.

And thereupon defendants counsel calls as a witness MR. WALLACE D. MOONE, who being first duly sworn to state the truth, deposes as follows in answer to interrogatories propounded to him by C. K. Offield, Esq.

Q. 1. Please state your name, age, residence and occupation?

A. Wallace D. Moone; 48 years old; libvery business;
1661 Chicago.

Q. 2. How long have you been in the livery business in Chicago?

A. 25 years.

Q. 3. Where is your present place of business and for how long?

A. 2021 and 2023 Wabash Ave. For eight years.

Q. 4. How many cabs or vehicles do you have in your business, either as owner, or boarders?

A. About 100 to 125.

Q. 5. How does your business compare with that of the largest livery men of this city?

1662 A. One of the largest stables in the city.

Q. 6. Do you employ rubber tires to any extent upon vehicles?

A. Yes sir, I have run them on nearly all of my own vehicles and a great many of them on boarders.

Q. 7. How long have you used rubber tires on your own vehicles?

A. Since 1896.

Q. 8. Have you ever used rubber tires of the Rubber Tire Wheel Company, the complainant in this case, that are like in construction the section of tire I now show

you marked "Complainants Exhibit Sample of Complain- 1663
ants Tire"?

A. Yes I would say it was the same thing.

Q. 9. When did you first purchase and use any of such tires from the complainant?

A. In 1897—January I think.

Q. 10. How many of such sets of rubber tires have you purchased and used during 1897 and so far during 1898?

A. I should say that I had as many as ten sets I would think so.

Q. 11. What, if anything, happens to these tires, so that they have to be removed and replaced by other tires? 1664

Objections repeated which were made to the testimony of Frank P. Stone, at Q. 8, and which by consent are to apply once for all to all this class of testimony.

A. They cut out either at the sides or the bottom, one of the two. Sometimes at the side and sometimes at the bottom.

Q. 12. Whereabouts do complainants tires cut out at the sides?

A. The top of the flange.

Q. 13. Of the ten sets of tires that you have purchased 1665
of the complainants, how many of them are there that have not already cut out and been destroyed by cutting at the sides or at the bottom?

Objections repeated.

A. I couldn't say, because I don't know just how many my foreman has had replaced new. Nearly all of those tires have been replaced by new tires with a larger channel and larger rubber. All of the first tires that I had put on—probably about five sets—those have all been replaced I think with larger tires in front—an inch and

1666 three quarters instead of an inch and three-eighths and an inch and a half.

Q. 14. What was the condition of the old tires when replaced?

A. They were either torn out at the sides or at the bottom. They were not worn out nor half worn out.

Q. 15. Please look at the tire I now show you marked "Defendants Exhibit Complainants Commonly Cut Tire" and state whether such tire represents the cutting and destruction of the tire before injured by use, as you have described?

1667 Objections originally noted to the introduction in evidence of this exhibit repeated.

A. Yes, that represents the cutting out at the sides. Once in a while they are cut out at the bottom. Mine cut out further upon the sides than this.

Cross-Examination by Mr. Bowmann.

X-Q. 16. Referring Mr. Moone to your answer to Q. 13, I understand your answer to mean that the first sets you tried, the Rubber Tire Wheel Company put rubber tires which were not of sufficient size for the vehicle to which they were applied. Am I not right?

1668 A. Yes sir. That would be my judgment and always has been.

X-Q. 17. And where the Rubber Tire Wheel Company has applied sizes sufficiently large which you describe as the inch and three quarters, the satisfaction has been very good, has it not?

A. I have not used them long enough to determine that. So far they have.

X-Q. 18. Your livery work is largely general public pack work, is it not. That is to say, your vehicles are used by the general public for livery hire?

A. Of course, I keep them for the general public but

I don't stand any rigs on the street. I do Club work and 1669
Hotel work and private work on orders.

X-Q. 19. And in view of the location of your livery establishment, in the City of Chicago, your carriages necessarily get hard service over the streets in the down town portions of Chicago, do they not?

A. Not as much as carriages would that stood down town at the hotels.

X-Q. 20. But your carriages as I understand you, are not subjected to light service as compared with carriages used largely on the Boulevards?

A. Well my carriages are used on the Boulevards a great deal for park driving. That is a great part of my 1670
work and of course, shopping and calling.

X-Q. 21. But do you not consider that your carriages get pretty hard service, or rather the rubber tires on the wheels, in view of the car tracks and paved streets where the shopping districts are located?

A. Not as much as a street hack would.

X-Q. 22. So that from your observation, a solid rubber tire which properly applied, has given service on a hack in steet service, would be a tire that should certainly give satisfaction on your carriages used for the work you have described? 1671

A. That would depend wholly on the amount of work that the hack done. If he was equally busy with my carriage, his work would be the hardest on the tires.

X-Q. 23. Referring then to the use of street hacks, would you say that your carriages get more use?

A. They travel a good many more miles probably.

X-Q. 24. Then your judgment would be that in view of the fact they traveled a good many more miles, the service is harder on the rubber tire than on the average street hack?

A. The strain is not as much, but the wear is more.

1672 You can understand that plainly, because you see in going from 22nd St. to theatre, I of course take the Boulevard to within two or three blocks at the outside of the threatre. It would be a small proportion of the distance the carriage would have to travel on the stones and on car tracks.

X-Q. 25. Then I understand that in your judgment, the carriage which is used largely on the stone streets and car tracks is the one which has the greatest strain on the rubber tire?

A. Yes, sir.

1673 X-Q. 26. Do you still use solid rubber tires on your carriages?

A. Yes, sir.

X-Q. 27. How many carriages have you, heavy and light?

A. Somewhere between 40 and 50 rigs.

X-Q. 28. How many of these do you have in public livery use, to which a solid rubber tire is not applied?

A. I should say one-half of them.

X-Q. 29. Do you use the pneumatic rubber tire?

A. I only have one. That is I only own one. There are three or four of them in the barn.

1674 X-Q. 30. You have been have you not a customer of the Firestone Victor Rubber Tire Company?

A. Yes, sir. Both of them, and I am still.

W. D. MOONE.

Subscribed and sworn to before me, this 11th day of November, A. D. 1898.

FREDERICK C. GOODWIN,
Notary Public.

[SEAL.]

Recess from 11:45 to 1:30 P. M.

1675

And thereupon defendants counsel calls MR. ROBERT C. IRWIN, who being first duly sworn, deposes as follows in answer to interrogatories propounded to him by C. K. Offield, Esq.

Q. 1. Please state your name, age, residence and occupation?

A. Robert C. Irwin; age 34; 5832 Wabash Ave., Chicago; Superintendent repairing department, C. P. Kimball & Co.

Q. 2. Is that the Company of which Mr. Charles F. Kimball, a witness recently on the stand as a witness in this case, is President of?

1676

A. Yes.

Q. 3. How long have you held your position as Superintendent of that Company in Chicago?

A. Eight years.

Q. 4. How long have you been with the Company in any capacity?

A. 14 years.

Q. 5. Are you familiar with the use and application by the Company of solid rubber tires to the various wheels manufactured and sold by the Company?

A. Yes, sir.

1677

Q. 6. For how long a time has the Company applied rubber tires or sold vehicles with solid rubber tires in their business?

A. That of course includes all kinds of rubber tires. I should think about 1887 or 1888.

Q. 7. As Superintendent what have you personally to do with either the application or the removal of solid rubber tires from the wheels of the Company's vehicles?

Complainants counsel renews the objections made to Qs. 8 and 9 of testimony of Frank P. Stone, which by consent, are to apply once for all.

1678 A. I have got to see that the work is done in time and done properly.

Q. 8. Is it part of your duty as Superintendent so to do?

A. Yes, sir.

Q. 9. How does the rubber tire application of your company compare in extent to the business of the largest carriage manufacturers in the West, at least, as to rubber tire use and application?

A. In retail, we are the leaders.

Q. 10. Are you familiar with the rubber tires of the
1679 complainant in this case, like the section of rubber tire I now show you, marked "Complainants Exhibit Sample of Complainant's Tire"?

A. Yes sir.

Q. 11. How long have you been familiar with those tires?

A. Between three and four or five years.

Q. 12. How extensively during that time has your Company applied such rubber tires of the complainant to their carriage wheels?

A. I couldn't answer that to any extent as to the exact number. I could guess at it.

1680 Q. 13. Well get at it in another way—about what proportion of solid rubber tires used by the Company during those years have been the complainant's tires?

A. Up to the Fall of 1897, the entire amount.

Q. 14. During those years, what has been the average life time of the complainant's tire in use?

A. I should think 24 months actual use.

Q. 15. Is there any difference in the life time of the tire between a public use and a private use, as those uses are ordinarily understood?

A. Yes, a great deal.

Q. 16. Please then give the life time of the public

use and the private use as you have found it of these tires? 1681

A. In private use, we have had some wheels which had to be renewed in less than twelve months. While in public use, I could not answer, having no experience.

Q. 17. To what class of vehicles and for what use principally, are your rubber tires applied?

A. All classes of vehicles used by private people.

Q. 18. For what reason or reasons do you remove or have you removed, the rubber tires of the complainants and put on new tires therefor? What happens to the tire that necessitates its removal?

1682

A. In most cases the tire is not worn to outside appearance. But is torn away inside of the channel.

Q. 19. At what point or points is it torn away?

A. I have seen it both torn at the sides and also the wire pulled through on the bottom.

Q. 20. Have you ever seen an instance of a rubber tire of the complainant being worn out by use in distinction from being destroyed before being worn out by the cutting or breaking of the tire along the side or along the bottom?

Objected to as immaterial and incompetent, and on the grounds heretofore stated. 1683

A. Yes.

Q. 21. How many such instances do you know?

Objections repeated.

A. I couldn't just say the number of tires, but I have seen a number of front wheels that way.

Q. 22. Any rear wheels?

A. No.

Q. 23. Which has the more accurate knowledge of the matters relating to rubber tires that you have testified to in connection with the Company—yourself or Mr. Kimball?

1684 Objected to as calling for an assumption of the witness.

A. In regard to rigs coming in for repairs, I see all of them and a great deal Mr. Kimball does not.

Q. 24. What kind of use as to street driving, are the carriages you sell to private parties in this city, subjected to?

Objected to as calling for an assumption.

A. They are for private use. Used almost altogether on boulevards.

Q. 25. What rule, if any, did the complainant have as to the size of the tires furnished you and governing
1685 such size in the application of the tires to your wheels?

Complainants counsel objects to question as incompetent and further on the ground, it calls for hearsay evidence.

A. In putting on tires, we always put the tire on to match the size of the rim, taking into consideration the neat appearance it would have upon the carriage.

Q. 26. Well, what rule did the complainant follow or standard of measurement, in directing the application of their tires to your wheels?

Objections repeated.

1686 A. On the catalogues they had the remark to the effect that the size of tires on a vehicle should equal the size of the axle.

Q. 27. You mean a steel axle?

A. Yes sir.

Q. 28. What are the usual sizes of those axles on different wheels of the principal type?

A. On a brougham it is an inch and three-eighths. On a light brougham an inch and a quarter. On a landau it would be an inch and a half and on a light one, inch and three eighths.

On a business buggy it is seven-eighths to an inch and 1687
one-eighth, according to the size.

Q. 29. Please look at the tire that I now show you and which is marked "Defendants Exhibit Complainants Commonly Cut Tire" and state whether or not the destruction of such tire by cutting, as shown in this exhibit, in distinction from wearing out, is substantially of the character you have described relating to the destruction of complainants tire in your deposition?

Objections heretofore made by the complainant to testimony as to this exhibit, which by consent were to apply once for all, here repeated.

Objected to further, as leading. 1688

A. Yes, I have seen lots of cases of that kind.

Cross-Examination by Mr. Bowmann.

X-Q. 30. It is true, is it not, that C. P. Kimball & Co's. customers still use a solid rubber tire like Complainants as shown in the exhibit, marked "Complainants Exhibit Sample of Complainants Tire," and that the said Kimball company seldom turn out a job without such a rubber tire?

A. We have sold carriages within the last few months that complainants tire had been on. This tire may have 1689
been put on carriages when the carriages were in course of construction, which may have been some time ago.

X-Q. 31. The question I have asked does not refer only to complainants tire, but the solid rubber tires like complainants, as shown by said exhibit?

A. Yes, we put on tires like complainants tire, as regards the style of the channel. But in my opinion the shape of the rubber is somewhat different.

Objected to as largely irresponsive.

X-Q. 32. I suppose in referring to the shape as being

1690 different, you have in mind the rubber tire made by the Firestone Victor Rubber Tire Company from whom you now purchase tires?

A. No.

X-Q. 33. Your company does purchase from the Firestone Victor, does it not?

A. No.

X-Q. 34. From whom does it purchase?

A. We have purchased from Morgan & Wright, Imperial Rubber Tire Wheel Company as well as the complainants.

1691 X-Q. 35. The Morgan & Wright has only recently been tried by you, has it not?

A. Yes sir. We tried a set of Morgan & Wright's about eight months ago at first.

X-Q. 36. And that is the tire where you refer as to the shape being different, is it not?

A. No, it is not. It is the Imperial Rubber Tire.

X-Q. 37. That is put on by Kelley, Maus & Co.?

A. Yes, I understand it formerly was, but not now.

ROBERT C. IRWIN.

Subscribed and swon to before me, this 11th day of November, A. D. 1898.

1692 FREDERICK C. GOODWIN,

[SEAL.] Notary Public.

Adjourned from 2:30 to 3:30 o'clock P. M.

And thereupon a further adjournment was taken until Saturday, Nov. 12, 1898, 10:30 A. M.

Saturday, Nov. 12, 1898, 10:30 A. M.

Parties met pursuant to adjournment.

Present: Same as before.

And thereupon an adjournment was taken to 2 o'clock P. M.

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And thereupon defendants counsel calls MR. THOMAS B. JEFFERY, who being first duly sworn to state the truth, deposes as follows in answer to interrogatories propounded to him by C. K. Offield, Esq.

Q. 1. Please state your name, age, residence and occupation?

A. Thomas B. Jeffery; age about 54 years; residence, Chicago; occupation, bicycle manufacturer.

Q. 2. Are you one of the founders of the house of Gormully & Jeffery Manufacturing Company, or corporation?

1694

A. I am.

Q. 3. Has you or your company ever used solid rubber tires on your bicycles?

A. I have and the Company has.

Q. 4. During what years and how extensively?

A. From the year 1879 up to the present time I have been exclusively engaged in that business and within the period have manufactured several hunderd thousand bicycles.

Q. 5. In view of certain issues in this case, please state approximately, between the years 1880 and 1890, how many bicycle and tricycle wheels you equipped with solid rubber tires?

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A. Somewhat over 50,000; somewhat less than 100,000.

Q. 6. What kind of a tire has superseded the solid rubber tire or cushion tire on a bicycle?

A. One containing an under pressure and called the pneumatic tire.

Q. 7. Mr. Jeffery, between the years 1880 and 1890, did you have any trouble in holding your solid rubber tires in place on the bicycle wheel or rim, or in the tires

1696 cutting or wearing on the edge of the rim in which they were inserted?

Objected to as leading; and as immaterial.

A. We had no serious trouble from either cause you mention.

Q. 8. How did you obviate or prevent the trouble either of the tire getting out of the rim in use, or the wearing of the tire upon the outer edges of the rim?

Objections repeated.

A. By sinking the tire deeper into the flanges of the rim, or by molding the tires so that the exposed portion tapered away from the rim, so that it became narrower
1697 than such rim where it protruded.

Answer objected to on the grounds stated, and further, on the ground that it is wholly secondary evidence.

Q. 9. Between the years 1880 and 1890, what different means was employed by you in bicycle or tricycle manufactures, in holding or seating solid rubber tires into the rims?

Complainants counsel renews his objections on the ground that the question calls for secondary evidence, the tires themselves being the best evidence
1698 of the constructions mentioned, which objection is made once for all to this class of testimony by consent of counsel.

A. I used two methods for securing the tires to the rims. The first consisted in using a wire run through a hole in the tire, which tire was not endless, and in some cases, twisting the wire together to form a union at its ends, and in other cases, brazing the two ends of the wire together, taking care to unite the ends, so that the wire would be shorter than the largest periphery of the rim, and by the use of levers, springing the tire and its wire

band on to the trough shaped groove, which formed the periphery of the rim. 1699

The other way of securing the rubber tires to the rim consisted in applying cement to one or both parts and baking them together.

Q. 10. Mr. Jeffery, in fastening a tire of solid rubber in a bicycle rim, by either one or two wires, and in case the wires when first put in position before tightening, lay in holes in the rubber tire on a line with or slightly above the plane of the outer edges of the flanges, what is the effect upon the tightening of the wire to its normal condition as to its location in these holes and the outer edges of the flanges? 1700

Complainants counsel renews its objections heretofore made and further objects on the ground that it calls for an opinion of the witness when he has not qualified as an expert in such matters.

A. In tightening the wire into its place, its effect is to become crowded into the lowest part of the channel in which it is located, and in doing so, will change the position of the hole in the rubber, so that it also comes nearer the bottom of the channel, and the result will be that the aperture for the wiring which was at first in the center of the rubber, gets out of shape and nearer to the inner edge of such rubber. 1701

Q. 11. Please examine Fig. 8 of "Defendants Exhibit Wynne English Patent of 1889" and state where the location of the wires shown in such figure would be in case the solid rubber tire was tightly clamped down into the channel and there held by such wire? I mean where would the two wires be in that case in relation to the periphery of the channel in which such tire is seated.

Complainants counsel repeats all the objections heretofore made.

1702 A. The exact position would depend upon the tightness given to the wires, but in all cases, in order to hold such a tire on the rim, it would be necessary to make the wire so short that they would change the shape and position of the hole and take a position below the edge of the flanges.

Q. 12. Of what material were the rims of your bicycles made between 1880 and 1890?

A. Steel.

Q. 13. Do you remember during those years, of any special incident where your solid rubber tires wore or abraded in use, by lateral pressure upon the outer edges
1703 of the flanges, and if so, what did you do to prevent this result?

Objections repeated and on the ground that the question is leading.

A. I do remember that such difficulty arose and I formed the tires with tapering sides—that is to say, I reduced slightly the amount of rubber that it may not become compressed on the rim, but retained within the rim.

Q. 14. Mr. Jeffery, what change if any, has there been in the quality and character of vulcanized rubber, if any,
1704 during the last 10 years, of which solid rubber tires were made for bicycles?

Complainants counsel objects to this question on the grounds stated above.

A. The material has been compounded with great care and skill, for the purpose of making it more durable. In the early days, it was a practice to use the finest kind of rubber, having no compound except sufficient to cause it to vulcanize, and great stress was laid upon the properties of softness and elasticity, such tires possessed. But as it was found that such tires did not prove durable, rubber makers and bicycle manufacturers used great ef-

forts to obtain a compound of rubber that would wear 1705
better and these efforts resulted in the use of a much harder quality of rubber and more durable tire.

Q. 15. Have you ever used or applied solid rubber tires to any other class or types of wheels, except the wheels of bicycles and tricycles?

A. I have never applied them for the purposes, but I used rubber tires on my own carriage wheels.

Cross-Examination by Mr. Bowmann.

X-Q. 16. Mr. Jeffery, state if you know, why the pneumatic rubber tire supplanted the solid rubber tire in 1706
the use of bicycles?

A. Principally because it was more elastic. There were other reasons, but the one I mention is the chief one.

X-Q. 17. Then the chief reason was that the rider of a bicycle desired a rubber tire which would prevent as much as possible, any jars to himself in the use of the same? Is that not correct.

A. Yes. That is correct.

X-Q. 18. Do you remember what was known as the high wheel, as contradistinguished from the bicycle now in use, known as the Safety bicycle? 1707

A. I do.

X-Q. 19. Do you not remember that for a number of years there was used on that high bicycle wheel, a solid rubber tire which was cemented to the rim-

A. I do.

X-Q. 20. And was that not the sole means used in holding the rubber to the rim?

A. It was not the sole means, but for a period between 1880 and 1890, it was almost the universal means.

X-Q. 21. And that high wheel with the solid rubber tire as described, increased in its use during the years

1708 you mention very largely, did it not, and gave almost general satisfaction?

A. The statement you have made is generally a correct one.

X-Q. 22. And it is true, is it not, that a bicycle rider owing to the fact that he can easily avoid obstacles, and to the further fact that he considers his own comfort in avoiding jars, so far as possible, gave his bicycle solid rubber tire very easy use as compared with the use that is given a vehicle solid rubber tire in the ordinary use of such vehicles?

1709 A. The statement is true regarding the use given by some riders, but other riders used their wheels with great roughness and carelessness and abuse the tires more than the riders of some carriages do.

X-Q. 23. Were you familiar with the make of bicycle solid rubber tire manufactured by Sterling Elliott at Newton, Mass.

A. No, I was not familiar with such tire.

X-Q. 24. In your answer to Q. 13, where you spoke of having some difficulty where your solid rubber tires abraded in use, you may state more definitely as to the time when this difficulty arose?

1710 A. About the year 1885 or 1886.

X-Q. 25. Did that difficulty occur with the solid rubber tires applied by the Gormully & Jeffery Company, and was that change that you have mentioned made at their place of business?

A. Yes, it did apply to those tires used by the Gormully & Jeffery Mnfg. Co. and the change was made at their place of business.

X-Q. 26. And this applies also to your answer to Q. 8, where you referred to sinking the tires deeper into the flanges of the rim, etc? As to the place where this was done?

A. Yes. 1711

X-Q. 27. You may state with reference to the time when it was that you adopted the plan of sinking the tire or by molding the tires by which I understand you mean the channel iron in the way mentioned in your answer?

A. About the year 1885 or 1886.

X-Q. 28. When did you cease the use of the solid rubber tire, in the construction of your bicycles?

A. About the year 1892.

X-Q. 29. Now do I understand that the methods you have mentioned as having been tried in 1885 were continued by you during those years, from 1885 to 1892? 1712

A. No, the method of reducing the width of that portion of the rubber by tapering it outside of the rim was not used in the Gormully & Jeffery factory after 1887. But the tires were made of harder material in circular form from such year 1887 until abandoned in 1892.

X-Q. 30. So that after a few trials of the method you first mentioned, you adopted the circular form as being best adapted to the use of your solid rubber tire on the bicycles made by you?

A. No. After the use for two or three years and the sale of many thousands of such tires having tapered sides, I found that the public did not like the appearance of 1713 such tires and concluded that the round ones were more salable and therefore ceased manufacturing the wedge shaped ones.

X-Q. 31. Can you state to whom any of these bicycles were sold with the wedge-shaped solid rubber tires?

A. At the period they were made the Gormully & Jeffery Co. had some hundred of agents and purchasers at wholesale of the goods and while I think it likely that the books of the Gormully & Jeffery Co. would show the names of the users or buyers. I can only remember the name now of the Pope Manufacturing Company of Bos-

1714 ton, Mass., who bought large quantities, of such tires from the firm of Gormully & Jeffery, who later became the Gormully & Jeffery Mnfg. Company.

X-Q. 32. Then I understand these tires were shipped over the country generally and that the Pope Manufacturing Company purchased bicycles with this shaped rubber tire?

A. Yes, that assumption is correct.

X-Q. 33. Now with reference to the other change besides the one you have described as making a wedged shaped rubber tire, which other change you mentioned in
1715 your direct examination as having been a change in the molding of the channel iron, how long did you adopt this change in the channel iron?

A. In my answer to Q. 8 which I mentioned molding the tire, I meant molding the rubber tire and not the channel.

X-Q. 34. And I understand from your answer to Q. 8, that you did one or the other of the two things there mentioned. That is to say, in some cases you would sink the tires deeper and in others you molded the rubber in a wedge shaped manner. Is that not correct?

A. Yes, that is correct.

1716 X-Q. 35. And that you abandoned the sinking of the tires deeper when you adopted the change in molding the rubber, as just stated?

A. Nothing was done quite so definite as your question would lead one to suppose.

X-Q. 36. You will explain as near as you can, with reference to these changes, as to when you did abandon making the tire deeper into the rim?

A. There was no time during the period in which we made solid rubber tires that we definitely adopted or abandoned the sinking of the tire into the rim. It became well known to me that the large amount of projecting

rubber then popular on wheels to produce the cushioned effect, if used by careless riders who run their wheels against curbstones, would become cut by the rim, but the large round tire was popular and while we tried to give our wheels a popular appearance, we tried all the time to get the tires sunk as deeply in the rim as purchasers would care to take them. The riders themselves did not know the reason for cutting, as well as the manufacturers did, and my practice was to sink the tires deeply in the rim whenever I knew the riders were careless about the rims of the tires. 1717

X-Q. 37. Do you remember of doing this during all the years of from 1885 to 1892? 1718

A. Yes, I do.

X-Q. 38. And in the way you have mentioned when you knew the rider to be apt to be careless?

A. I did that through those years when I had reason to believe the riders were careless.

X-Q. 39. You may state who had the work of applying the solid rubber tires to the bicycles. I assume that you did not do this yourself. That you have men employed to do it? Kindly state the names of the persons.

A. I do not know the names of the workmen who actually did the work and do not think any of the workmen's names are now on our pay roll that I can discover them. I remember the name of the foreman who had charge of that tire assemblers in the years 1895 and 1896. The foreman is Edward Burles, he being now employed by the Gormully & Jeffery Mnfg. Co. 1719

X-Q. 40. In your answer to Q. 9, you spoke of two methods of securing the tires to the rim. Which was the last one that you used?

A. The cemented process.

X-Q. 41. How long did you use the wire?

1720 A. From the end of the year 1879 to about the year 1881.

X-Q. 42. In your answer to Q. 13, where you spoke of forming the tires with tapering sides. That refers to the rubber does it not, as explained by you, with reference to your answer to Q. 8?

A. Yes, each time I mention tire, I refer to rubber, as its composition.

THOS. B. JEFFERY.

Subscribed and sworn to before me, this 12 day of November, A. D. 1898.

1721 FREDERICK C. GOODWIN,
[SEAL.] Notary Public.

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Defendant's Exhibit Patentee Grant's April 19, 1897, Deposition.

IN THE UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

The Rubber Tire Wheel Co.
vs.
The Columbia Pneumatic Wagon Wheel Co. } In Equity.

Depositions of witnesses examined on behalf of complainant in the above entitled cause, before me, Chas. I. Welch, a Notary Public in and for the County of Clark, 1724
State of Ohio, by consent and in pursuance of the annexed notice and under the provisions of the U. S. Statutes as revised, Secs. 863, 864, 865, and under the equity rules, at the Office of Paul A. Staley, Gotwald Bldg., Springfield, Ohio, beginning at 10 o'clock in the forenoon of Friday, April 9th, 1897.

Present: Paul A. Staley, on behalf of Complainant; Mr. C. W. Stapleton, Esq., on behalf of Defendant.

And thereupon A. W. GRANT, a witness produced on behalf of complainant, being first duly sworn, testifies 1725
as follows:

Q. 1. Please state your name, age, residence and occupation?

A. Arthur W. Grant; 38 years old; residence, Springfield, Ohio; occupation, manufacturer and superintendent of The Rubber Tire Wheel Co.

Q. 2. How long have you occupied your present position and state what experience, if any, you have had in mechanical matters and especially with reference to rubber tires for vehicle wheels.

A. I have held my present position since New Years,

1726 1894. I left school in the year '75 or '76; spent six months at the tinner's trade to familiarize myself with that branch of mechanics; then spent about the same length of time at the molder's trade for the same purpose. I then took up the machinist's trade and served about three years, when I then followed stationary engineering to the Fall of 1880, at which time the Gendron Iron Wheel Co. was organized and I was solicited to take the position of foreman, which I did. I stayed in their employment until the Fall of 1884, filling the positions of foreman and assistant superintendent. At that time I
1727 was solicited by The Tricycle Mfg. Co. of this City to take the position of foreman in their factory. I was foreman of the machine shop. I stayed in their employment until New Years, 1894, filling the positions of foreman, assistant superintendent, and superintendent, at which time, through the assistance of Mr. E. S. Kelly, we organized the present Rubber Tire Wheel Co., and I have been connected with the same since that time. My first experience in vehicle tires occurred about the year '81 or '82 at which time I got up a vulcanized fiber tire. My first experience in rubber tires occurred at about the same time and I have done more or less experimenting ever
1728 since with rubber tires.

Q. 3. I call your attention to a copy of letters patent No. 554,675, which is in evidence in this case as "Complainant's Exhibit Complainant's Patent," and will ask you to explain briefly the mechanical features of the device shown and described therein, omitting from your consideration any reference to the claim or claims of said patent, the construction of which is a matter for the Court?

A. The mechanical constructions and features of said patent is in the shape of a metal rim or channel, the special shape of the rubber tire and the location of the

retaining wires. I found on experience that in making 1729
the metal rim I could obtain better results by having the flanges of the same at an angle to each other so that the groove or channel formed by the flanges was narrower at its base than at the outer edge or top of the flanges. I also found that by making the rubber tire the shape specified in the patent I would obtain better results than by any other. In referring to the drawings we find that the rubber tire is essentially of the same height as width of rim and that the base or unexposed part of the rubber tire is essentially the same shape as the inside of the metal rim, but the tread of the rubber tire being made on the 1730
segment of a circle of much smaller diameter than the width of the tire, this being done to save chipping by crowding the rubber over the edge of the steel channel. I also found that I could obtain better results by having the retaining wires nearly if not wholly below the top of the flanges on the metal rim.

Q. 4. Are you the Arthur Grant named as the applicant in the letters patent referred to?

A. I am.

Q. 5. In the experiments which you have heretofore referred to as having been made in rubber tires, please state about how many different kinds and styles of rubber 1731
tires were used or experimented with by you prior to the time that you adopted the tire shown and described in this patent?

A. I cannot state positively how many, but I can bring to mind at the present time some three or four; the first one being a solid tire held in position by cementing, which proved a failure, this tire being nearly round. The next one was also a solid rubber tire held in position by cementing in metal rim, but oval in shape. The next one was a round tire held in with one wire passing entirely through its center; the next being a tire in shape nearly

1732 square held in place by two wires passing entirely through the same.

Q. 6. To what extent were these different tires tested and with what result?

A. They were all tested sufficiently to prove whether they were a success or a failure. Some of them failed for the reason that it was impossible to keep them in position. The last one held in with two wires failed because they broke or separated on a line with holes for retaining wires.

Q. 7. To what extent has the tire or device set forth in the patent referred to by you been tested and with
1733 what result?

A. It has been tested very thoroughly and found to prove very successful, we having very little, if any, trouble with any of the thousands of tires we now have in use.

Q. 8. I call your attention to "Complainant's Exhibit Complainant's Regular Tire" and will ask you to state, if you know, what it is?

A. On examining the exhibit spoken of I find that in examining same that in my opinion it is a section of steel channel, rubber tire, and also a section of retaining wire
1734 used in the rubber tires put on by The Rubber Tire Wheel Co.

Q. 9. Please compare the constructions you find in this exhibit with those described and shown in "Complainant's Exhibit Complainant's Patent," without reference to the claims of said patent, and state how said constructions agree or differ?

A. In reading over the specification I find that in describing same it says: "In constructing my improved rubber tire I take an ordinary vehicle wheel, preferably with a plain wooden felly and to this wooden felly I secure a metal rim, having at its edges outwardly project-

ing flanges." On examining the exhibit I find that it 1735
tallies in every respect, as it no doubt was intended to be fastened or placed on a wooden rim and its flanges extend outwardly as described. Then again referring to the specification of the patent it says: "In this groove or channel I place a rubber tire which is of peculiar shape. This rubber tire is formed preferably of a single piece, but not continuous." As far as that is concerned I am not able to state from looking at the exhibit when it was made continuous or not, but no doubt it was not made continuous, as it will be almost impossible to make the holes for retaining wires if the tire was continuous. The 1736
specifications also state that it is provided throughout its length with openings through which are passed retaining wires. In examining the exhibit I find it has openings through which are evidently passed retaining wires. Again referring to the specifications I find that it reads that these retaining wires are separate and independent and extend entirely through the openings, which I find is the same in the exhibit. Reading further in the specifications I find that it says that the tire is formed of substantially the same depth as width. On measuring the exhibit I find that it is practically the same. Reading further I find that it says that the unexposed portion of the 1737
tire or that portion which is enclosed within the rim is formed of substantially the same shape as the inner channel of the rim. Upon examining the exhibit I find that it is practically the same. Reading further I find that it says that the openings c^1 through which the retaining wires pass are also formed within the inner or unexposed portion of the tire. On examining the exhibit I find that it is the same in this respect. On reading further in the specification I find that it states that the bottom portion of the tire is re-enforced with a canvas strip which covers the entire bottom and may project slightly along the

1738 sides. On examining the exhibit, I find that it is constructed in this manner. In fact I cannot see but what the tire is the same in all essential points as the one described in the patent.

Q. 10. I call your attention to "Complainant's Exhibit Jones Wheel With Loose Tire," also to "Complainant's Exhibit Defendant's Regular Tire," and ask you to compare the two exhibits, one with the other, and also with the construction set forth in the patent which you have just referred to, without reference to the claims of said patent, and state how they agree or differ?

1739 Question objected to as incompetent, the exhibits referred to not being sufficiently proven or identified as the product of the defendant and not properly being in evidence as exhibits in this case. The question should be to compare the complainant's regular tire with "Complainant's Exhibits A and B," which have been stipulated into the case as defendant's tire.

A. After examining the exhibits mentioned I find that in all essential points in reference to the shape and construction of metal rim and rubber tire, they are practically the same. I also find that they do not vary one from the

1740 other and are practically the same as the rubber tire described in the patent.

Q. 11. You state that they are "practically" the same. Please state more in detail what you mean and give your reasons for any opinion which you may express.

Same objection as to Q. 10.

A. What I mean by being "practically" the same is that as far as the mechanical construction and the probable durability of the tires exhibited and the one described in the patent are the same. The only places where they vary are on the outside or exposed part of metal rim and also a very slight difference in the sides of the ex-

posed part of the rubber tire. These differences in my 1741
opinion would make no difference whatever in the wearing qualities of the tire.

Q. 12. Please give your reasons more in detail for expressing the opinion that "Complainant's Exhibit Defendant's Regular Tire" and "Complainant's Exhibit Jones Wheels with Loose Tire" are practically the same with reference to their mechanical construction?

A. It has been my experience that the essential point in a rubber tire are these; that the retaining wires should be quite, if not wholly, below the upper edge of the flanges of the metal rim, and also that the angle formed by the sides of the unexposed and exposed sides of the 1742
rubber tire should be at or below or within the sides of the metal rim, and on examining these exhibits I find they have all of these points. I also find on examining the two exhibits and measuring the same, they prove to be the same as far as shape, size and construction is concerned.

Q. 13. Now, please describe more in detail your reasons for the opinion you expressed that these two exhibits embody practically the same mechanical construction as the tire shown and described in the patent?

A. They both have the metal rim with outwardly-pro- 1743
jecting flanges so that the channel formed by the same is narrower at its base than at the top. I also find that they both have a rubber tire with the unexposed portion the same shape as the inside of the metal rim. They also both have two independent retaining wires running the entire length of the rubber tire or openings for same. I also find that in these exhibits the openings are below the top of the metal flanges. Then again, the angle formed in the rubber tire by the sides of the unexposed parts and the exposed parts are within the said flanges. I also find that they both have the canvas strip spoken of

1744 in said patent and in the same position as specified in the patent.

Q. 14. I notice on the wheel, "Complainant's Exhibit Jones Wheel With Loose Tire," that the rubber portion of the tire seems to be longer than the periphery of the tire. How do you account for that?

A. In constructing this kind of a rubber tire, it is necessary to use a longer rubber tire than the circumference of the metal rim so that the compression that is caused by putting the rubber tire on will also keep the joint formed by the two ends of the rubber tire firmly together, and in this case the retaining wires being cut
1745 would allow the rubber tire to expand or elongate to its original position.

Q. 15. I call your attention to "Complainant's Exhibit Jones Wheel With Defendant's Regular Tire" and will ask you to state how the tire on this wheel compares with that on "Complainant's Exhibit Jones Wheel With Loose Tire" to which you have just referred and give your reasons for any opinion you may express.

A. Upon examining the exhibit spoken of I find that as far as I am able to examine same it is the same as the other exhibit spoken of; that is to say, the tire on "Com-
1746 plainant's Exhibit Jones Wheel with Defendant Regular Tire" is the same as "Complainant's Exhibit Jones Wheel With Loose Tire." The exposed part of the two tires seem to be exactly the same and the tire marked "Complainant's Exhibit Jones Wheel With Defendant's Regular Tire" has no doubt been compressed, or, in other words, the tire is longer than the circumference of the metal rim, for if not it would be impossible to keep the joint closed. I also find on slightly raising the side of said tire, the inside of metal flange is of the same shape and the angle caused by the sides of the unexposed and exposed sides of rubber tire are below the top of flanges

of metal rim. This tire also has a canvas strip in the same position as tire marked "Complainant's Exhibit Jones Wheel with Loose Tire." 1747

Q. 16. Please state how, if at all, the rubber tire on these different exhibits, that is to say, "Complainant Exhibit Defendant's Regular Tire," "Complainant Exhibit Jones Wheel with Loose Tire," and "Complainant's Exhibit Jones Wheel With Defendant's Regular Tire," compares with "Complainant's Exhibit Complainant's Regular Tire"?

A. I find upon examining "Complainant's Exhibit Complainant's Regular Tire" that it is the same as "Complainant's Exhibit Jones' Wheel with Loose Tire" and "Complainant's Exhibit Defendant's Regular Tire" and also "Complainant's Exhibit, Jones Wheel with Defendant's Regular Tire," in all essential points, which are the outwardly-projecting flanges of metal rim, the unexposed part of rubber tire being the same shape as the inside of metal flange, the angle formed by the sides of the exposed and unexposed sides of the rubber tire being below the top of the flanges of metal rim, and as far as I am able to examine the openings for the retaining wires are nearly if not quite wholly below the top of said flanges. 1748 1749

Q. 17. Please compare "Complainant's Exhibits "A" and "B" respectively, with the patent in suit which you have already referred to and state how they and each of them agree with or differ from the mechanical constructions of said patent, without reference to the claims of said patent, and give your reasons for any opinions you may express?

A. On reading over the specifications of letters patent No. 554,675, I find that it calls, as I have already stated, for the metal rim, with outwardly projecting flanges, these flanges forming a channel narrower at its base than

1750 at its outer edges; a rubber tire placed in same, the unexposed part being the same shape as the inside of metal rim; independent openings for retaining wires passing through the entire length of said, the height of rubber tire being about the same as width at rim, the sides of unexposed part of rubber tire forming an angle with the sides of the exposed part, the corner formed by these unexposed and exposed sides being within the flanges of said metal rim; also the retaining wires being nearly, if not quite, below the top of said flanges. Upon examining "Complainant's Exhibit A" I find that it tallies in every way excepting the angles of the sides of the rubber
1751 tire are slightly above the top of flanges of metal rim. Upon examining "Complainant's Exhibit B" I find that it tallies in every respect with the patent, with the exception of the location of the openings for the retaining wires, which seems to be a trifle high. This no doubt was caused to a certain extent by the grinding off of the top of flanges, which shows that it either has been ground or filed. Then again it may be caused by the section of rubber tire in "Exhibit B" being an imperfect piece, as one opening for the retaining wire is higher or farther from the base of the said tire than the other. Then
1752 again, explaining why I think that the top of the flanges on "Exhibit B" has been filed off is for the reason that a mechanic in designing these metal rims would no doubt carry the proportion of the thickness of metal flanges in accordance with the size of the tire they were to be used with, and on examining "Exhibit A," which is for a much heavier tire, I find that the top of the flanges are lighter than on "Exhibit B." With these exceptions I think the Exhibits "A" and "B" the same as the tire explained in said patent.

Adjourned until 1:30 P. M.

1753

Met pursuant to adjournment.

Q. 18. I call your attention to "Complainant's Exhibit C" and ask you to compare it with the channel iron in exhibits "A" and "B" and state how they agree or differ?

A. I find upon examining "Complainant's Exhibit C" that the flanges are higher in proportion to its size than "Complainant's Exhibit B." This only confirms more fully my belief that the flanges on "Exhibit B" have been filed or ground off, for as "Exhibit C" is a much smaller tire than "Exhibit B," if the proportions has been carried out in these two tire, "Exhibit B" would be considerable 1754
higher than it is. In comparing "Exhibit C" with "Exhibit A" I find that the proportions are more uniform. Also in both exhibits "A" and "C," the top of flanges are not so blunt as in "Exhibit B." This indicates also that the flanges on "B" have been filed off. Again in "Exhibit A" the openings in the rubber tire for the retaining wires are entirely below the top of flanges. In "Exhibit B" they are somewhat above the flanges, but this may be caused to a certain extent by the sample of rubber tire in "Exhibit B" being an imperfect piece, as I find that the openings for retaining wires are out of 1755
position. For instance, by taking the opening for one retaining wire and it shows considerable difference in height from bottom of rubber one end with the other. This section of tire was no doubt discarded as being unfit to use in the regular tire.

The defendant moves to strike out all that portion of the answer which is the opinion merely of the witness as to the discarding of the tire "Complainant's Exhibit B" as being a conclusion; also all that portion of the answer wherein the witness assumes that "Exhibit B" is irregular or has been filed or ground

1756 away as being a conclusion incompetent and irrelevant.

Q. 19. What effect, if any, would in your opinion the slight difference you have discovered between "Exhibit A" and the constructions described in the patent have in the operation of the tire as respects its durability or otherwise?

A. As I have explained before, the only difference between the tire of the patent and "Complainant's Exhibit A" is in the corner formed by the angle of the unexposed side and exposed side of the rubber tire being
1757 slightly above the edge or top of steel channel. In my opinion this is not enough to cause a bad effect, as the holes for the retaining wires in "Exhibit A" are in the place explained in the patent.

Cross-Examination by Mr. Stapleton.

X-Q. 20. Beside the four or five kinds of tires that you have mentioned as having experimented with, I suppose you are familiar with the large number of solid and cushion rubber tires aside from those, are you not?

A. I am familiar with quite a number of them.

X-Q. 21. Have you made the matter something of a
1758 study?

A. I have devoted nearly all of the studying or experimenting to tires of my own invention and not so much to tires of other makes.

X-Q. 22. Have you examined a considerable number of other rubber tires?

A. I can't say that I have.

X-Q. 23. Have you ever seen any other rubber tires except those of your own construction and those alleged to have been made by defendant?

A. I have a few.

X-Q. 24. About how many do you think?

A. Probably four or five. 1759

X-Q. 25. Do you regard yourself as reasonably familiar with the state of the art regarding solid rubber tires as revealed by patents and from what you have observed?

A. If I fully understand the question I have had very little experience, if any, in looking over patents. The few tires I speak of having seen I have examined.

X-Q. 26. You have examined them not only in America but in foreign countries have you not?

A. I have examined one solid rubber tire in foreign countries; the same one in this country.

1760

X-Q. 27. What tire was that?

A. It was what we know here as the "English" tire.

X-Q. 28. How many patents have you taken out in America on rubber tires; and in the method of constructing rubber tired vehicle wheels.

A. I do not recall but two patents at this time on rubber tires and one on the method of putting on tires.

X-Q. 29. Describe what those patents are to which you refer?

Question objected to as irrelevant.

A. One is the present patent in litigation; one is a design patent on the same; the other is for tools for 1761 putting on the tire.

X-Q. 30. Did you take out a patent on a device for holding the ends of the tire together?

A. I believe there is such a patent in existence taken out by D. P. Jeffries and myself. As I have taken out quite a number of patents on other things and this one being several years old, it had slipped my mind.

X-Q. 31. What year did you first commence to experiment with solid rubber tires?

A. I think in the year '81 or '82.

1762 X-Q. 32. Describe the tire with which you first experimented?

A. If I understand you to mean a rubber tire, it was something on the shape of what is now known as the "English" tire. I done my experimenting for the Gendron Iron Wheel Co. at their dictation and they afterwards took out a patent on same.

X-Q. 33. Describe that tire to which you refer.

A. The base or part of tire which sets in steel channel was considerable wider than any other part of the tire and after the rubber tire was placed in the channel the channel was crimped in against the sides of the rubber
1763 tire, forming a kind of a dove-tail, and the unexposed part of that tire was of much harder rubber than the exposed part.

X-Q. 34. It consisted of an iron channel attached to a wooden rim with the rubber inserted in the iron channel, did it?

A. No, sir, it did not. They were then experimenting on steel wheels for both vehicles and bicycles. It had no wood rim whatever.

X-Q. 35. Prior to that had you experimented with a rubber tire applied to the wood felly without any metal
1764 channel?

A. I don't remember any such experimenting.

X-Q. 36. After the English tire experiments, describe the tire that you next used?

A. If you mean by the "English" tire, the "Gendron" tire, the next one was a round tire cemented into the metal channel.

X-Q. 37. What was the shape of the metal channel?

A. It was somewhat of the shape of the letter "U," being almost a half circle on the inside and quite a half circle on the outside.

X-Q. 38. Did that have a flat base where it was applied to the felly? 1765

A. It did not. This was for a steel wheel.

X-Q. 39. Which was the next tire with which you experimented? Describe it.

A. The next tire was an oval-shaped tire set in a U-shaped rim, the rubber tire sitting on its edge or narrow part. That was for a steel wheel too.

X-Q. 40. Describe the next tire with which you experimented?

A. The next tire was a round tire held into place by one retaining wire running through its center. This tire was fitted into a steel rim the same as the one that I described before, being nearly a half-circle on the inside and quite a full half-circle on the outside. This one was originally designed for a steel wheel, but afterwards was adopted to use on wood wheels. 1766

X-Q. 41. Describe the shape of the metal rim that you used with this round tire?

A. I described it in my last answer.

X-Q. 42. Did it have a flat base?

A. If I understand your question, it did not.

X-Q. 43. How was it attached to the wood rim?

A. Later on, when it was adapted to wood wheels, it was bolted on as the ordinary steel tire. 1767

X-Q. 44. Then it had a flat base where it was applied to the wood felly?

A. In your former question I did not understand you to mean that part of the tire next to the wood rim. If so, I should have answered yes.

X-Q. 45. Did the flanges flare or were they straight at right angles with the base?

A. The steel channel was originally made, as I said before, on nearly a half circle on the inside and quite a half circle on the outside. This changing of the amount

1768 of circle we were using caused the tire to be much thicker at its bottom than at the side and when we come to adopt the tire for wooden rims we merely cut off a part of the circle on the bottom, leaving that part of the under or inner surface of the steel channel flat, but the rest of the steel channel as it was.

X-Q. 46. Then I understand this metal rim had a flat base and convex flaring flanges? Am I right?

A. If I fully understand the question it had.

X-Q. 47. About what year was this that you used that style of tire?

1769 A. I cannot recall any circumstance that will bring it definitely to my mind, but I think it was late in 1893.

X-Q. 48. After that, describe the next tire with which you experimented?

A. The next tire, that is, the rubber tire, was nearly square in cross section, made to fit in a flat bottom steel channel.

X-Q. 49. With straight or flaring sides?

A. It had sides slightly flaring.

X-Q. 50. At about what angle to the base?

A. I do not remember, but the sides set nearly at a right angle to the base.

1770 X-Q. 51. Were the sides of the rubber perfectly straight?

A. They were not.

X-Q. 52. Please describe their shape?

A. They were in shape similar to the sides of the channel; the top of the rubber tire being the same shape as the bottom. My idea was to have a tire that I could reverse.

X-Q. 53. How many wires were used in this tire?

A. Two.

X-Q. 54. What time was this that you experimented with this tire?

A. If I understand by your question the time the tire was actually tested, the test commenced I think in December, 1893. 1771

X-Q. 55. After this tire, what was the next tire you experimented with?

A. This is the tire that the present Rubber Tire Wheel Company was started or organized to manufacture, but after manufacturing same for about six months we found that it was a failure. I then got up the present tire, which was about July or August of 1894.

X-Q. 56. In what respect was it a failure?

A. It would shortly after using commence to split out on the sides, caused by the bottom of the holes for the retaining wires being at or above a line drawn through from the top of the steel flanges. 1772

X-Q. 57. This tire, then, consisted of a metal base with flaring flanges applied to a wood felly with a rubber tire within the metal channel, with the sides at an incline to each other both above and below the periphery of the rim, with two retaining wires at or about the center of the rubber tire, did it not?

A. The steel channel had flanges that on the outside set square or at right angles with the base. The flanges were slightly thinner at the top than at the base, this being done so that the rolling mill could more readily roll the same, where if the flange stood at right angles with the base on the inside it would be very difficult to roll, as the roll in leaving the flanges would have a tendency to tear them to rough them up. This was my idea at that time for making the flanges thinner at the top than at the base and in constructing the rubber tire to fit in same I tapered the sides of the rubber tire to conform with the shape of the inside of channel merely to have a reversible tire, as that was my object at that time, and in order to have 1773

1774 it reversible I located the retaining wires in the center from top to bottom.

X-Q. 58. Describe at what point the tire was the widest?

A. A considerable distance above the top of flanges; at this point, it being quite as wide as outside of flanges.

X-Q. 59. When did you stop working for the Tricycle Mfg. Co.?

A. The last day of the year 1893.

X-Q. 60. Was this company making rubber tires for vehicle wheels while you were in its employ?

1775 A. They were making steel wheels with rubber tires for vehicles?

X-Q. 61. But not tires for wood wheels?

A. They had put on I think one set of rubber tires on wood wheels within the last thirty days of my connection with them.

X-Q. 62. Describe that tire?

Question objected to as irrelevant and incompetent and further as inquiring for matter not brought out in the direct examination.

A. I had described it, it being a round tire.

X-Q. 63. With one wire?

1776 A. Yes.

X-Q. 64. Was it during the time you were in the employ of the Tricycle Mfg. Co. that you experimented with the tire which you had described as the one which immediately preceded the one in suit?

A. It was while I was temporarily employed by them and I made all experiments as far as making one set of tires at my own expense.

X-Q. 65. How long were you experimenting with the different kinds of tires which you have described, give the length of the time as nearly as you can as to each kind of tire?

A. As that time goes back some sixteen years, it will 1777
be impossible for me to state anywhere near the length of time.

X-Q. 66. Fix as nearly as you can the time when you first began experimenting with the tire described in the patent in suit?

Question objected to as calling for a matter not brought out in the direct examination, and further, as calling for matters which if competent at all, is competent only in defense, and further, as calling for confidential matters belonging to the witness and irrelevant at this time to the matter in controversy 1778
and the witness is instructed that he may use his discretion in giving testimony as to matters of this confidential nature.

A. I cannot remember the exact time, but it was sometime in the latter half of 1894.

X-Q. 67. State as nearly as you can when you began experimenting with the tire that preceded the one described in the patent in suit, that being the tire that you have described as intended to be reversible?

A. In the latter part of 1893.

X-Q. 68. State if you can what time in 1893?

Objection to Q. 66 repeated and notice is given 1779
that complainant's counsel will move the court to strike out the testimony so objected to on the grounds stated.

A. I do not remember the exact time, but it was in the latter part of 1893.

X-Q. 69. State if you can when you first adopted the flaring flange?

Question objected to as incompetent and irrelevant, and calling for matters not brought out in the direct examination.

1780 A. I do not remember positively, but think it was about the same time that I designed the present tire.

X-Q. 70. Describe in what particulars the tire that you have described as a "reversible" tire differs from the tire described in the patent in suit?

A. It differed very materially in that flanges flared less, the steel channel was much shallower, the holes for the retaining wire were wholly above the edges of the steel flanges and the extreme wide part of the rubber tire was considerably above the top of flanges and quite as wide as the outside of said flanges.

X-Q. 71. Did it differ in any other respects?

1781 A. The upper half of that tire was the same as the lower half in order to make it reversible.

X-Q. 72. Was it flat on the top and bottom.

A. It was.

X-Q. 72. Was the base of the metal channel flat?

Objected to as irrelevant.

A. If I understand you to mean the side next to the wood rim, it was.

X-Q. 73. State how you experimented with this particuar tire?

A. I experimented by making one set and placing

1782 them on my phaeton.

X-Q. 74. Was it with only that experience that you formed a company to manufacture tires which you have described as a "reversible" tire?

Objected to as irrelevant.

A. As far as that particular tire was concerned, yes.

X-Q. 75. Do you regard the quality of the rubber as being an important factor in the durability of rubber tires?

A. If I understand you to mean the wearing quality of the tire, it may have something to do with it, but if you

mean mechanically successful, I do not think it has anything to do with it. 1783

X-Q. 76. Do you mean that the quality of the rubber has nothing to do with the durability of the tire in actual use?

A. I think that question was answered by my last answer.

X-Q. 77. Do you decline to answer?

Question objected to on the ground that the witness has already answered.

A. I do not decline to answer, as I think I have already answered.

X-Q. 78. The question is repeated and defendant's counsel states that the desire is to separate and make plain the answer of the witness previously given. 1784

Complainant's counsel objects to the question on the ground that it is misleading, ambiguous and confusing and in justice to the witness he suggests to counsel for defendant that he ask the witness in so many words what he desires to know.

A. I do not understand the question.

X-Q. 79. Do you mean that rubber of poor quality in actual use will give the same service as rubber of good quality in actual use? 1785

A. I do not.

X-Q. 80. The shape of the rubber is also regarded by you as an important factor in the wearing quality of the tire, is it not?

A. I don't know that I can say exactly wearing quality, but the shape of the tire has a great deal to do with the life of the tire.

X-Q. 81. Explain what you mean by "life of the tire."

A. I mean this, that you may either actually wear the tire out or it may chip, cut and burst out so as to be worthless; consequently that is the life of that tire.

1786 X-Q. 82. What facilitates the cutting and chipping referred to?

A. It is caused a great deal by pinching the sides of the tire between obstacles in the street and the edge of the metal flange.

X-Q. 83. Do you regard the shape of the flange as an important factor in regard to the wearing of the rubber tire that it contains?

A. To a certain extent, yes.

X-Q. 84. And to overcome and obviate these defects you made from time these experiments, did you?

1787 A. If I understand you to mean the experiments made prior to the getting up of the tire described in the patent in litigation, I do.

X-Q. 85. Have you experimented since the adoption of the tire described in the patent in suit? I mean with reference to rubber tires for vehicles?

A. As regards shape or construction of same, no.

X-Q. 86. Is the tire actually used by your company now in form and shape like that described in the patent in suit?

A. It is.

X-Q. 87. Name the important features which you re-
1788 gard as necessary to a practical and successful rubber tire?

Question objected to on the ground that the witness has already answered the same.

A. Having the retaining wires nearly, if not quite wholly below the top of the steel flanges, the wide part of rubber tire nearly or wholly within said flanges, the outer periphery or tread of rubber tire of considerable less width than the width of the tire at top of flanges. It is also quite essential to have a strip of canvas or its equivalent on the base of the rubber tire to stiffen same

and protect or prevent wires from splitting through at the bottom. 1789

X-Q. 88. Are there no other feature important in your estimation?

A. I do not bring to mind any vital feature that I have not named.

X-Q. 89. Then you do not regard the quality of the rubber, if it be of proper shape, as important?

A. Only in the question of the wearing quality of the tire.

X-Q. 90. Well, what would be the difference in the wearing quality of a cheap grade of rubber compared with an expensive grade? 1790

A. I am not able to state, as that could only be derived at by experimenting with the two qualities.

X-Q. 91. In your experiments with rubber tires have you experimented with the qualities of rubber used?

A. In experimenting on different rubber tires I have used different priced rubber, but not to prove which quality of rubber or priced rubber was the best, but merely to prove the success or failure of the construction of the tire.

X-Q. 92. Have you not found that rubber of a certain compound or quality gives much better service and longer service than rubber of a different compound? 1791

A. I have not.

X-Q. 93. Then you do not think that the material that enters into the construction of the rubber tire has very much to do with the durability of it?

A. As far as the actual wearing qualities are concerned, it may have a little to do with it.

X-Q. 94. You do not then regard it as a very important feature?

A. I do not as far as making a tire mechanically successful.

1792 X-Q. 95. Well, leaving off the mechanical part what do you say?

A. It may be possible to get one compound that would wear a little longer than another.

X-Q. 96. Have you noticed a great difference in the rubber that you have used; that is, a readiness of one kind to chip and break through, and a lack of that or obstinacy on the part of another kind.

X-Q. 97. I have not where both tires were constructed the same.

X-Q. 98. Of the important features which you have mentioned, which do you regard as most important?

1793 Question objected to as irrelevant and incompetent.

A. It would be hard for me to state, as I consider them all quite essential.

X-Q. 99. Then you do not think that one is entitled to any greater consideration than the others?

A. It may have, but that could only be proven by actual experiments.

X-Q. 100. State your judgment from what experience you have had?

Question objected to on the ground before stated.

1794 A. I would not like to place myself on record as saying, for, as I said before, that could only be proven by actual experiments.

X-Q. 101. Then you regard the features you have named as all equally important, do you, to a practical and successful rubber tire?

Question objected to as incompetent and irrelevant and further on the ground that it is immaterial whether one or more essential or desirable features in a constructioon should be more or less important when used singly.

A. They are all important, but I do not say equally important. 1795

X-Q. 102. In your judgment from your experience, which do you say is of greatest importance?

Objection to cross-question 101 is repeated, and a further objection is made that the same question has already been put to and answered by the witness.

A. I do not say that any one is of more importance, for, as I stated before, this could only be proven by actual experimenting.

X-Q. 103. The question refers to your judgment based solely on what experiments you have made and what experience you yourself have had. Please answer it from that standpoint? 1796

The objections to the last two questions are repeated and complainant's counsel moves to strike out the questions on the grounds stated in said objections.

A. I cannot answer that question any different than I have done for I never made experiments to prove the relative value one with the other.

X-Q. 104. I quote from the patent in evidence: "The tire has been described thus minutely because the constructions described are important. . . . It has been found in practice that by the constructions above described I produce a rubber tired wheel rim which is capable of more use and which will remain in position better than any other tire which has ever been put on the market." That was true, was it not, when you made it? 1797

A. It was.

X-Q. 105. And yet you now say that you have had no experience and cannot distinguish between three or four important features, being the essential features of a successful rubber tire. How do you reconcile the two statements?

1798 A. When I got up the present tire it embodied all these features. I found that it gave me a perfect tire and as that was what I was after I did not deem it important to experiment to prove which feature was the best.

X-Q. 106. You would not regard the metal rim as being proper unless the sides were flaring, would you?

A. In my opinion it makes a better tire to have the sides flaring, but I cannot say that it is absolutely necessary.

X-Q. 107. Is it not also better in your judgment to have the top of the flanges rounded?

Objected to as irrelevant and immaterial.

1799 A. I would not want to say, because I never heard of or saw a metal rim for holding a rubber tire with anything else than a round edge.

X-Q. 108. You do say that it is important in your judgment to have the angle or widest part of the rubber below the periphery of the rim, do you not?

A. If I understand your question correctly, I do not know that it is absolutely necessary for it to be below the top of the flanges.

X-Q. 109. Do you think it would be equally good if even with the top of the flanges?

1800 A. It might be possible to construct a tire that would give very good service with it even with the top of the flanges providing the tire embodied all the other essential points.

X-Q. 110. At the time of making the application for the patent, you had no, or scarcely no knowledge of the art as it then existed, did you?

Question objected to as irrelevant, incompetent and immaterial inasmuch as the witness has testified only as a mechanical expert with reference to mechanical constructions and as to comparisons of one mechanical construction with another in which a

knowledge or lack of knowledge as to the prior art does not enter into as an element, and for these reasons and for the further reason that the question has no bearing upon anything brought out in the direct examination, complainant's counsel moves to strike out the question and all questions relating to the same subject-matter. 1801

A. I have before stated on several occasions what my experience has been in rubber tires for vehicles and I would not like to place myself on record as saying that signified a good deal of experience or a little of experience.

X-Q. 111. Are you familiar with the construction of the Willoughby tire as illustrated in the papers shown you? 1802

Question objected to on the ground stated in objection to X-Q. 110, and it is further objected to on the grounds that the paper referred to is not in evidence, that it is not identified as any paper prepared by this witness or with his knowledge or consent; that it is not identified with anything to which the witness has testified to in his direct examination, and the witness is instructed that he may decline to answer this question or similar questions relating to papers not in evidence or connected with the matters testified to by him in his direct examination. 1803

A. I decline to answer.

X-Q. 112. Are you familiar with the construction of the tire known as the Carmount tire as illustrated on the card shown you?

Objection and notice repeated and complainant's counsel moves to strike out the question on the grounds stated.

A. I decline to answer as only a part of the tire is shown.

1804 X-Q. 113. Will you answer if the whole tire is shown you?

A. If in my opinion I am able to pass judgment I would not decline to do so.

X-Q. 114. Why did you decline to answer the question as to the Willoughby tire?

A. I am not a patent expert, do not profess to know very much about patent cases, if any. I always leave such matters with my attorney.

X-Q. 115. Did you understand the question as to the Willougby patent?

1805 Question objected to as it does not appear that there was any Willoughby patent or that the papers referred to have any connection with any patents in evidence in this case or any construction in evidence in this case.

A. I believe that I did.

X-Q. 116. Did you think that it called for expert testimony?

A. I decline to answer on the grounds named.

X-Q. 117. That I am not a patent expert and as I understand it, am not here in that capacity.

X-Q. 118. The question is, are you familiar with the
1806 construction of the Willoughby tire as illustrated in the papers shown you. Do you think that calls for expert testimony?

Question objected to for the reasons stated to X-Q. 111 and the motion to strike out is repeated.

A. I can't say that I am familiar with it.

X-Q. 119. Is that also true of the Carmount tire as illustrated on the card shown you?

Objection, notice and motion repeated.

A. I don't remember of ever seeing the tire before.

Section of rubber tire shown witness by defendant's counsel.

X-Q. 120. Have you ever seen tires in use like the section shown you? 1807

Objection, notice and motion repeated, and complainant's counsel protests against the further examination of this witness as to matters and things not in evidence or brought out in the testimony in chief.

A. I am not able to state, but if I should see this particular tire in a section of the steel channel it belongs to, I, no doubt, could more readily answer.

X-Q. 121. You have criticized "Complainant's Exhibit B" as having its flanges out of proportion and as being blunt on the top. Compare it with the tire marked "Complainant's Exhibit, Defendant's Regular Tire" and tell me if it is more blunt? 1808

A. After examining the exhibits mentioned I should say that it was.

X-Q. 122. Well, point out to me the angle on "Complainant's Exhibit B?"

A. I do not know what is meant by the angle.

X-Q. 123. I mean, point out any angle on the tire?

A. There are two angles formed by the base and two unexposed sides of rubber tire. There are also two angles formed by the two unexposed sides and two exposed sides. 1809

X-Q. 124. What sort of an angle would you describe that last you have named?

A. I would call it a very obtuse or blunt angle.

X-Q. 125. Is it not a curve?

A. It would be very hard to make an angle a curve and I have already said that it was an angle.

X-Q. 126. That part which you refer to as an angle you know to be the point where the molds join together when the tire is vlucanized, do you not?

A. I am not very well posted in the manufacture of rubber, but what little I do know I should not think it

1810 would be absolutely necessary that the joint or parting in the mold would come at that point.

X-Q. 127. Are not the indications that what you have described as an angle is merely a thin ridge left by the mold and not any material part of the tire?

A. I do not consider it so.

X-Q. 128. You have described the angle shown in "Exhibit Complainant's Regular Tire" as being below the periphery of the metal rim and also as being within the periphery of the metal rim. Do you use those terms below and within as synonymous?

1811 A. I am not quite sure that I understand your question right, but if I do it is not absolutely necessary that the angle should be below the top of the flanges, but it is quite essential that it should be within the flanges.

X-Q. 129. By the term "within" then I understand you to mean between the edges of the flanges at the periphery?

A. What I mean is that by drawing two parallel lines at right angles to the base taking in the upper and most outward points of the inside of the flanges, the angle of the tire would come within these lines.

1812 Adjourned to meet at 9:30 to-morrow, April 10th, 1897, same place.

Met purusant to adjournment at 9:30 April 10, 1897 at same place.

X-Q. 130. Have you any personal knowledge as to who made, vended or sold the exhibits marked "Com plainant's Exhibit Jones Wheel With Loose Tire," "Complainant's Exhibit, Defendants Regular Tire" and "Complainant's Exhibit, Jones Wheel With Defendant's Regular Tire"?

A. I have not.

X-Q. 131. State whether or not the exhibits last

named vary from "Complainant's Exhibits A and B" in having the angle or widest part of the tire below the periphery of the rim? 1813

A. In exhibit marked "Complainant's Exhibit Jones' Wheel With Defendant's Loose Tire" the angle or widest part of the rubber tire is slightly below the periphery of the flanges. "Complainant's Exhibit B" is the same. "Complainant's Exhibit A" is slightly above, but all are within said flanges.

X-Q. 132. Do you regard the tire described in the patent in suit as being the best tire from a mechanical standpoint that with your experience you can now produce? 1814

Question objected to as irrelevant and immaterial inasmuch as what the inventor is able to do now would have no effect on the value of the invention at the time it was produced, and complainant moves to strike out said question.

A. I have never given it any thought.

X-Q. 133. Please give the matter some thought and answer the question as best you can?

The objection to last question is repeated and the further objection is made to the question that it calls for matters confidential to the witness, which are wholly irrelevant and which he is not bound to disclose and the motion to strike out is repeated. 1815

A. That would necessitate days and probably months, as I could not answer the question without trying to invent something better, as it is quite improbable that anyone could get up a valuable invention in a few moments.

X-Q. 134. Do you mean to state that notwithstanding that you have been the superintendent of The Rubber Tire Wheel Co. for over three years, that you have not considered the matter of improvements in the tire described in the patent and which you first used?

1816 The objection to the last two questions and motion to strike out are repeated.

A. Up to the time I invented the present tire I gave it a great deal of thought, but we were then satisfied with the tire and since this time I have been busy on other things.

X-Q. 135. At the time you applied for the patent in suit, did you then intend to embody the best mechanical features of which you then had knowledge in that application?

Objected to as irrelevant and immaterial, and for the reasons stated in the previous objections.

1817 A. As I now remember it, I did.

X-Q. 136. The metal rim described in the application was at that time a common article of commerce, was it not?

Objected to as irrelevant and immaterial.

A. Not to my knowledge it was not.

X-Q. 137. Had you to require its special construction at that time for your use?

Objection repeated.

A. We did.

X-Q. 138. Is that also true regarding the metal rim
1818 used with the reversible tire?

Objection repeated.

A. It was. The first set of steel tires being made by hand and costing me $57.00.

X-Q. 139. How about the rubber used in the reversible tire? Was that a special construction at the time?

Objection repeated.

A. If I understand you to mean the shape of the tire, it was.

X-Q. 140. Made by the Goodrich Company?

Objection repeated.

A. Yes, sir.

X-Q. 141. Who made the steel channels you have referred to as costing $57.00? 1819

Objection repeated.

A. I cannot recall his name at this time, but his place of business is at the corner of West Main St. and Jackson St. this city.

X-Q. 141. How do you account for the many failures to produce a practical and successful rubber tire?

A. The failures in my judgment were owing entirely to the construction of the tire.

X-Q. 142. Do you mean mechanical construction?

A. I do.

1820

X-Q. 143. State whether or not you knew at the time of the application for the patent in suit, or have since learned, that all the essential features embodied in your application, to wit: a metal rim with flaring flanges, a rubber tire held within this rim with one or two wires located within the periphery of the rim and with the angle or widest part of the rubber tire located even with or below the periphery, with a canvas strip upon the bottom of the rubber tire and with its top much narrower than at the point even with or just below the periphery, had not been used and described many years before, and also whether or not those various features had not been 1821 used separately in connection with others in the making and using of rubber tires for vehicle wheels?

Question objected to as irrelevant and immaterial as the patent shows for itself what elements were new in combination and it matters not which, if any or all of the elements were old in different devices, and the witness' knowledge or lack of knowledge on the subject is immaterial to the question at issue, and a motion is hereby made by complainant to strike out.

A. To my knowledge I did not.

1822 X-Q. 144. Assume that such was the case and that rubber tired vehicle wheels embodying the features above named had been used, can you account for their failure to become a commercial success and if so, state why?

Question objected to as entirely irrelevant and immaterial and as calling for an assumption of facts entirely unwarranted from anything which appears in this case and for the opinion of the witness as to a matter which to say the least is extremely indefinite and improbable, and further as incompetent and the motion to strike out is repeated.

A. I do not understand that I am here to assume any-
1823 thing but merely to state what I know.

Defendant's Counsel asks that the answer be excluded as not responsive and repeats the question, and asks the witness to state his judgment regarding the matter, assuming the facts to be as stated.

A. I decline to change my answer.

X-Q. 145. On what grounds do you decline to answer?

A. For the reason given in my former answer.

X-Q. 146. And is it your understanding that you are to be the judge and to determine what questions are
1824 proper and what are improper to be put to you?

A. It is not.

X-Q. 147. Can you answer the question?

A. No different than I have.

X-Q. 148. Do you mean that you are incapable of forming an assumption?

Question objected to on the ground that the whole matter is irrelevant and immaterial and on the further ground that the witness has a right to decline to express an opinion on a matter so indefinite and improbable as called for in questions 143 and 144.

A. I am not, but I understand a witness in any case 1825
is to tell what he knows, not what he assumes.

Counsel for defendant instructs the witness that the witness is obliged to answer hypothetical questions when proper in other respects and questions founded upon an assumed state of facts, he having been put upon the stand as a mechanical expert. And again asks the witness the question, to wit:

X-Q. 149. Assuming that if rubber tires for vehicle wheels have been used and which were constructed with a metallic rim with flaring flanges, with the angle of the rubber tire and the retaining wires located at or below the periphery of the rim and with a narrowed tread, 1826
how do you account for the fact that they have not proved a commercial success?

In view of the instructions by defendants' counsel complainant's counsel adds that it is proper for the witness to express an opinion concerning mechanical constructions if such constructions are sufficiently clearly set forth, but the witness may always be the judge as to whether or not the matter is sufficiently clear in his mind to warrant an opinion or conclusion.

Complainant's counsel, however, objects to the 1827
question on the grounds that the matter is irrelevant and immaterial and that the assumption is indefinite, ambiguous and improbable and renews the motion to strike out.

A. I would not want to place myself on record as giving my opinion without first seeing a tire embodying the features mentioned that had given out.

X-Q. 150. Do you fully comprehend the question, No. 149?

A. I think that I do.

1828 X-Q. 151. Then you are capable of assuming the state of facts that the question states, are you?

A. If I understand your question right, I am not.

X-Q. 152. Do you know that one or more rubber tires that for a time have been upon the market have proved failures?

A. I should not want to place myself on record as saying they were failures, but there have been tires placed upon the market that were not an entire success.

X-Q. 153. Did any of them embody any of the features of the tire described in the patent in suit?

1829 Question objected to, as entirely irrelevant and immaterial and defendant's counsel is reminded that one of the elementary principles of patent law is that features or elements of patents, which are combined, need not necessarily be new to be patentable; hence the whole matter is irrelevant and immaterial and the motion to strike out is renewed.

A. Not that I can recall.

X-Q. 154. Have you forgotten the tire you have described as a "reversible" tire invented by yourself?

1830 Question objected to as irrelevant and immaterial and further on the ground that if it is intended to imply that this tire now referred to is in any way an anticipation of the present patent, that the dates are not sufficiently established for that purpose, and the motion to strike out is renewed.

A. In making my last answer I did not take into consideration any inventions of my own, as I did not understand that that was what you meant, but even in that case I do not consider that that tire had the essential features of the present tire.

X-Q. 155. What has been the cause for the lack of success in the tires which you have observed aside from your own invention?

Objection repeated. 1831

A. Some were defective for reason that they could not keep them on and others went to pieces in short time.

X-Q. 156. Went to pieces from what cause?

A. Being cut and chipped between obstacles and the edge of the steel channel and separating at the point of holding device, and others so-called scalping; that is to say, the upper part or a portion of the tread of tire would separate from the body of the rubber tire by being pressed onto the flanges of steel channel.

X-Q. 157. What was the reason for the rubber being pressed on the edge of the flanges? 1832

A. In some cases the large or wide part of rubber tire overhung the flanges in construction; others being as large if not larger on the tread as they were at the flanges, and again, by being held into steel channel so loosely they would have a tendency to creep up onto the flanges.

X-Q. 158. You have mentioned a tire with which you are familiar as the "English" tire. State whether or not that has been a commercial success in the United States.

Question objected to as calling for the opinion of the witness in commercial affairs when he has been placed on the stand as an expert, only in mechanical affairs and a motion to strike out is made. 1833

A. It might have been so considered at one time.

X-Q. 159. Was it a mechanical success?

A. It was not, for as far as I know it was impossible to keep it in steel channel under all circumstances, and it would also scalp.

X-Q. 160. Are those tires largely used in the City of London.

Question objected to as incompetent and immaterial as the mere use in a foreign country cannot be

1834 set up as an anticipation or be considered in the construction of United States patents, and the motion to strike out is repeated.

A. They were a year ago; farther than that I cannot say.

X-Q. 161. I call your attention to the patent in suit and ask you if your first application was rejected by the Patent Office?

Question objected to as incompetent and irrelevant and as calling for secondary evidence, the best evidence being the records.

1835 (Question waived.)

X-Q. 162. I show you a certified copy of the patent in suit, and of the file wrapper and contents. You are familiar with the statements of the specifications contained in the application, are you not?

Objection and motion repeated and the further objection is made that the question calls for testimony concerning papers not in evidence and further that the witness has not qualified as an expert in the matters pertaining to applications for patents.

A. I decline to answer, as the papers mentioned answer the question.

1836 X-Q. 163. Are you familiar with the statements contained in "Complainant's Exhibit Complainant's Patent"?

A. I don't know that I am, as I pay no attention to patent matters, leaving that to my attorney.

X-Q. 164. State whether or not you read these specifications and testified from them yesterday?

Question objected to unless the matter of this and the preceding question are made clear to the witness by stating which statements in the specification are referred to, inasmuch as it appears from the record that the witness has not been called upon to testify

and has not testified concerning the entire specification. 1837

A. I did certain parts of them.

X-Q. 165. Please examine the specifications and tell me when you have examined them sufficiently what are the prominent features or elements in those specifications?

Question objected to as irrelevant, as indefinite and ambiguous, and the further objection is made to the question on the ground that the witness seems to have reviewed the subject-matter aimed at in the question on several different occasions in his testimony heretofore given. 1838

A. I am not able to state which are the most prominent as I know very little about patents.

X-Q. 166. You mean that you know very little about this patent?

Objection and motion repeated.

A. I probably know as much about this patent as I do of any of the other twenty or twenty-five different patents issued me. I do not remember of examining this patent whatever until yesterday.

X-Q. 167. Do you wish to leave the record showing that you know little or nothing about your own patent?

Objection repeated and the further objection is made that the witness has not been called upon in his direct examination to construe this instrument referred to as a patent, but only as to certain mechanical features described therein. A further objection is made on the ground that the witness has repeatedly pointed out the different mechanical features which are set forth in the specification and has compared them with other mechanical devices and has shown himself to be clearly expert in mechanics, which is the only branch in which he has qualified as an expert. 1839

1840 A. I seee no reasons for changing my answer.

X-Q. 168. Point out and enumerate as many of the features of the invention as you can from the patent in evidence?

The last objection and motion is repeated. A further objection is made on the ground that the claims define the invention; that the construction of the claims, and therefore the elements of the invention is a matter for the court and is a matter upon which this witness has not been called upon to express any opinion in his direect examination.

1841 A. I have on several occasions named what I consider the essential features in my invention. As to what the patent embodies I do not profess to know.

X-Q. 169. Name what you regard as the essential mechanical features in the specifications of the patent in suit, as stated in the printed specifications now in evidence?

Question objected to as irrelevant, indefinite and ambiguous.

A. As far as I am able to understand them they put forth as essential features the metallic rim with the flaring flanges, a rubber tire to fit in said flanges, the outer periphery or tread of rubber tire of narrower width than
1842 the tire is at the flanges, the angles formed by the sides of the exposed and unexposed sides of tire within said flanges, independent retaining wires running entirely through its length, nearly, if not wholly, below the top of flanges.

X-Q. 170. These features you have enumerated embody as you regard all of the essential mechanical features or elements of the invention and as set forth in the specification, do they?

Questions to X-Q. 167 and 168 are repeated and motion made to strike out the question on said objection.

A. I did not say all. I gave them as the more important ones as far as I was able to understand the specifications. 1843

X-Q. 171. Please name any others that you regard as being within the specification?

Objections and motion repeated.

A. The strip of canvas or its equivalent on the base of tire; upsetting or compressing the rubber lengthwise of the tire.

X-Q. 172. Are there any more; if so, name them?

Objections and motion repeated.

A. I do not know of any more as far as I am able to understand the specifications. 1844

X-Q. 173. Do you not know that your application for patent on the specifications from which you have enumerated these features and elements, was rejected?

Question objected to for the reasons and grounds stated in objections to X-Q. 161, which question was waived apparently in view of the objections the records of the Patent Office being the best evidence of the matter inquired about.

A. I do not recall the circumstance.

ARTHUR W. GRANT.

Defendant's counsel moves to strike out all the evidence of the witness Grant on the ground that he has refused to answer proper and competent questions and when answering them has answered them vaguely and not in response to the questions asked and that the defendant has been unable to properly and sufficiently cross-examine said Grant because of said contumacy and has been deprived from showing many facts material and important to the defendant by the witness because of the omission and refusal to answer proper and competent questions and gives 1845

1846 notice to complainant that a motion will be made to strike said testimony from the record.

Counsel for complainant renews his motion to strike out all the questions heretofore objected to on the grounds and for the reasons stated in objecting thereto.

At this point complainant rests.

State of Ohio, County of Clark, ss:

I, Chas. I. Welch, a Notary Public in and for the
1847 County of Clark and State of Ohio, hereby certify that the above witness, Arthur W. Grant, was by me first duly sworn to testify the truth, the whole truth, and nothing but the truth; that his deposition was reduced to writing by myself in the presence of the said witness and when completed read over by said witness and subscribed by him in my presence and in the presence of such of the parties and counsel as attended; that said deposition was taken pursuant to the annexed notice at the office of Paul A. Staley, 45 Gotwald Bldg., Springfield, Ohio, beginning on the 9th day of April, 1897, and continuing from day to day as set forth; that the parties were represented
1848 at the taking of said deposition by their respective counsel as set forth; and that I am not counsel or relative of either party, or otherwise interested in the event of this suit.

In testimony whereof I have hereunto set my hand and seal this 10th day of April, 1897.

CHAS. I. WELCH,
Notary Public,
Clark County,
Ohio.

[SEAL.]

FEES. 1849

Notary, 120 folios, at 20 cts.....$24.00
Witness, 3.00

$27.00

Paid by Complainant.

United States of America, Southern District of New York, ss:

I, John A. Shields, Clerk of the Circuit Court of the United States in and for the Second Circuit and Southern District of New York,

1850

Do hereby certify that I have compared the preceding with the original Deposition of Arthur W. Grant, in the cause entitled The Rubber Tire Wheel Company *vs.* The Columbia Pneumatic Wagon Wheel Company, on file and of record in my office, and that the same is a true and correct transcript therefrom, and of the whole of said original.

In testimony whereof, I have hereunto set my hand and affixed the Seal of said Court, at the City of New York, in the District and Circuit above named, this 27th day of December, in the year of our Lord one thousand nine hundred and seven, and of the Independence of the 1851 United States the one hundred and Thirty-second.

JOHN A. SHIELDS,
Clerk.

[SEAL.]

1852

Defendant's Exhibit Patentee Grant's August 10, 1898, Deposition.

IN THE UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.

The Rubber Tire Wheel Company
vs.
The Columbia Pneumatic Wagon Wheel Company.
} In Equity.

DEPOSITION OF ARTHUR W. GRANT.

1853

Wednesday, August 10, 1898.

Met pursuant to adjournment; present same as before.

And thereupon ARTHUR W. GRANT, a witness heretofore sworn in this case, being recalled and resworn, testified as follows:

Q. 1. Are you the Arthur W. Grant named as the inventor in the patent in suit and the same person who testified in this suit heretofore on behalf of complainant?

A. I am.

Q. 2. Have you read the testimony of defendants'
1854 witnesses Cooper, Aldrich and Stapleton given on behalf of defendant in this cause?

A. I have.

Q. 3. I call your attention to the testimony of defendant's witness Cooper, question 6 to 22, in which Mr. Cooper testifies in substance that he had taken off a thousand or so of the Kelly tires and introduced seven samples which he says fairly illustrates the condition of that thousand or more tires, and I call your particular attention in this matter to his answer 13, the question and answer of which is as follows:

"What did the people who brought them say to you about them if anything? 1855

"A. They all complained about them being a great nuisance; it takes so much time to come and get them repaired; they would get loose; in rainy weather they would rust; would fly over the body of the broom or the rig; make it look bad and cause it to be refinished. A number complained if they kept getting loose as they had been they would have steel tires put on; they would cut through; the end of the rubber would fly and knock the paint off the body of the rig; one or two had a lamp broke by flying. That is all I remember now."

I will ask you how the statements of this witness compares with your observation and experience in the use of 1856 complainant's tires?

The question is objected to as too broad, calling for a conclusion and not the proper way to rebut defendant's evidence, and as incompetent.

A. My experience has been entirely different to those of Mr. Cooper, as I never heard of one of our tires coming loose and splashing the side of the vehicle, or in doing any other damage to the vehicle, but have heard of such things occurring with the "English" or "Clincher" tire. I also never heard, as far as I can remember, of any one complaining that our tires were a nuisance and 1857 if the nuisance still continued they would discontinue the use of rubber tires. It also seems that if all, as he states, claimed they were a nuisance, and that they were dissatisfied with them, it would have been very easy for them all to have decided to quit using rubber tire and done so. My experience has been that what few tires we did have split on the sides or on the bottom was either caused by the rubber tires being defective in construction or being too loosely put on the wheel. In no case did I consider it the design of the tire.

Defendant moves to strike out the answer on the

1858 grounds stated in the objection and also such portions of the answer as are not responsive, referring to the English tire, and that it now clearly appears that the whole answer is a conclusion and not a statement of facts within the knowledge of the witness.

Q. 2. Please explain fully what you mean by the tires being defective in construction and also how you account for the cutting through of the wires when the tires are not put on tight?

A. When we started to put on this shape tire, that is, the one described in the patent in suit, the rubber manufacturers had a great deal of trouble of making the rub-
1859 ber tires mechanically correct, or in other words, making them the same as the drawings and specifications we furnished them called for. The holes for the retaining wires would sometimes be out of their position; then again the holes would sometimes be too large and irregular in shape. This was likely to occur at some point in the center of the tire that could not be detected without destroying the tire by cutting it into small pieces. Then, again, they would have trouble in getting the strip of canvas properly located. It would seem to shift at certain points to one side or the other. We watched these
1860 things very closely but as I stated before we could not always detect them without destroying the tire. The reason for the tire cutting through at the bottom when they are not put on tight is that immediately upon putting them in service the tire commences to travel or creep around the wheel. The retaining wires in the tire in my opinion stand still or continue to retain their original position with relation to the steel channel. The rubber tire traveling causes the wires to have the same effect as though they were traveling in the opposite direction through the rubber tire, which in reality they are doing. This causes the canvas and rubber to wear off from the

bottom of the rubber tire and the retaining wires to wear the holes in the rubber towards the bottom of the rubber tire. For example, in our inch and a half rubber tire, the holes, if in the proper position, are 3/16 of an inch from the bottom of the rubber tire, or in other words, there is a strip of rubber under the retaining wires of 3/16 of an inch thick. The wearing of the bottom of the tire and the bottom of the holes will reduce the thickness of this strip or neck of rubber much thinner and I have seen in some cases where it was wore down to 1/32 of an inch in thickness. In cases of this kind it would not take a very great strain on the side of the rubber tire to tear the wires through the bottom. 1861 1862

Q. 3. I call your attention to "Defendant's Exhibits" marked, respectively, from 1 to 7 "Kelley Samples," the same being pieces of old rubber tires, and will ask you to examine the same and state whether or not they are tires of complainant's make?

A. All of the samples mentioned are sufficiently worn so that in my opinion it would be impossible for any one to say who of the several concerns putting on rubber tire like those put on by complainant put on these particular samples with the exception of sample marked "No. 4 Kelly Sample," which I believe to be a sample of Victor tire, as the only distinguishing feature is the canvas strip, which is of much coarser fabric or at least coarser appearing than that used on our tire and I have often noticed that the Victor Rubber Tire Co. used this kind of fabric. Then again the holes for the retaining wires, which in this sample seems to be as originally made, are much farther from the bottom of the tire than the Rubber Tire Wheel Co. has them in this sized tire. In this sample they are a strong 3/16 of an inch from the bottom and in the Rubber Tire Wheel Co.'s tire they are 1/8 of an inch. 1863

1864 Q. 4. I call your attention to defendant's witness, Cooper's answer to X-Q. 66, where, in accounting for the fact that the tires of both defendant and complainant get loose, he says "the constant pounding over the stones; it lengths the wire," and I also call your attention to the fact that defendants' witnesses Stapleton and Aldrich testified that in their opinion the elongation or stretching of the wire was what caused these tires to become loose. Will you please state whether or not in your opinion this is correct and give your reasons for any opinion you may express?

1865 A. In my opinion that is a mistake, for the constant pounding of the tires over the street could not have the effect of stretching the wires only in that it might put a greater strain on the wire than the tensile strength of same, but any strain, whether applied by a blow or applied gradually, would have the same effect, as you could not stretch the wires by pounding same with a body or rubber between the wire and the body during the pounding. It is also utterly impossible to make a wire of twelve or fifteen foot length of absolutely the same tensile strength its entire length. There will always be some spot that is a trifle weaker than others. No matter

1866 how small this difference is it is sufficient to cause the wire to stretch at that particular point when it is strained beyond its tensile strength. The moment it starts to stretch at that point it becomes still weaker at that point caused by the separation of the molecules of steel and whenever there is any excessive strain put on the wire it will continue to stretch at that point until with the wire used by the complainant it has reduced in size to about one-half when it entirely separates and on examining same it will be found that within an eighth of an inch on either side from the point of separation the wire is still its original size. Therefore this wire could not be in-

creased in length by the stretching to exceed an eighth of an inch. It might possibly be in some cases 3/16 of an inch, which would not be enough to loosen the tires if they were properly put on tires in the first place. 1867

Q. 5. In addition to the reason which you have given have you observed anything practically in the use of your tires which proves that the wires do not stretch sufficiently to loosen the tires?

A. I have observed that when the tires are put on sufficiently tight that they will be as tight when the tires are worn out; that is, the section of rubber still left in the steel channel will be as tight as when originally put on. These tires also show that they have never traveled, that proving to my satisfaction that the tires do not get loose by the wires stretching, but by the tire traveling and wearing the rubber. 1868

Q. 6. With your knowledge of the business, what per cent of the tires furnished by the complainant would you say had gone wrong or had to be renewed or replaced on account of the wires cutting through, either from the sides or from the bottom?

Objected to as not proper in rebuttal and therefore irrelevant and incompetent.

A. It would be very hard for me to answer that question with any accuracy as nearly all the trouble that we had at that time was in the larger cities where the paved streets are sometimes in bad shape and the tires are consequently subjected to a much severer use than they are in small cities where the paving is better and I only occasionally visit our offices at the larger cities. But I should say from my observation, possibly one or two per cent of all the tire we ever put on. 1869

Q. 7. I call your attention again to the samples marked "Defendant's Exhibits Kelly Samples" and ask you to examine each of the samples, particularly those

1870 which are cut through at the bottom or sides to the openings for the retaining wires and state what in your opinion was the cause of this cutting through in each case?

A. In sample marked "No. 1 Kelly Sample" I have no doubt that the axle of the vehicle that this tire was on was sprung, throwing the wheel out of line, causing the tire to ride over on one edge of the channel, causing it to scalp off as shown. This tire does not have the appearance of ever traveling in the channel. As soon as the one side of the tire was scalped off, causing the tread of the tire to be over near the other flange it started to ride on this flange and if the tire had been left on for a time
1871 longer it would have no doubt scalped on that side, but in my opinion it was all caused by the axle being sprung.

Sample marked "No. 2 Kelly Sample" has no doubt in my opinion been overloaded either by the vehicle itself being too heavy or the same being drove too fast, which in either case the effect is about the same. The holes in this sample for the retaining wires seem to be imperfect. This I could not state with any accuracy whether it had anything to do with the tire going wrong or not unless I was permitted to cut the sample to pieces to more thoroughly examine the same.

1872 Sample marked "No. 3" is a tire that no doubt gave very good service, notwithstanding it probably came off before being entirely worn out, for, if this is a sample of a tire put on by complainant, it shows that it has been worn off on the tread 5/16 of an inch and it has been our experience that it takes at least a year to actually wear that much of a tire off. This tire also shows that it traveled or creeped in the channel to a great extent, which shows that it was put on too loose in the first place.

Sample No. 4 is not a piece of complainant's tire, but the reason for its going to pieces was no doubt caused by the holes for the retaining wires being too high.

Sample No. 5 is in about the same condition and shows about the same result as No. 3 sample with the exception that this tire shows that it has been worn off more on one side than the other, showing that it did not stand squarely on the road bed, showing that either the axle had too much swing or that the wheels were excessively dished. 1873

Sample No. 6 I doubt very much its being a piece of complainant's tire, but if it is it is very plain to see that it was a defective piece of tire originally or not mechanically correct as the holes are much too far apart.

Sample No. 7 shows a tire that put on entirely too loose as the canvas and rubber is entirely worn off from the bottom from traveling in the channel and shows one of the wires entirely worn through the bottom of the rubber from this cause. 1874

Q. 8. Defendant's witness, Cooper, referring to "Sample No. 3" in his answer to R-D. Q. 134 says: "This tire was cut by being loose and dirt got in under the tire which crowded it over the channel." Please state whether or not in your opinion there is anything to indicate such a condition or use as stated by Mr. Cooper?

A. I cannot find anything in the sample that indicates that the channel filled up with dirt or that the rubber tire had been out of the channel. The crease wore along the central bottom of the tire was no doubt caused by one or more of the bolt heads that bolts the steel channel onto the rim sticking up above the surface of the bottom of steel channel. 1875

Q. 9. In answer to R-D. Q. 135-6 Mr. Cooper says in substance that this sample has "one cut on each side towards bottom of tire and a cut or groove farther up on the tire" and again "the upper cut was made when the tire was in the channel, the cut was caused by the tire being gushed over the flange. The lower cut was after

1876 the rubber got loose and dirt got under the rubber." State whether or not you find these cuts referred to and state your opinion as to the correctness of Mr. Cooper's conclusions?

A. I cannot find the cuts spoken of. The only cuts that I can find in the tire that may be called cuts is immediately under the two retaining wires caused by the tire traveling in the channel and wearing the rubber immediately under the wires very thin and eventually getting a sudden or severe strain that tore the wires through the bottom. I do not find any cuts whatever on the sides of the tire.

1877 Q. 10. Which of these samples if any do you find are cut through to the retaining wires from the side?

A. No. 2 is the only sample that is either cut or tore into the retaining wires from the side and this might be caused, as I stated before, by an imperfect hole for the retaining wire.

Q. 11. Referring to this No. 2 Kelly sample, what is the total length of the sample and how far does the cut or break extend?

A. The total length of the same is 7½ inches. The space where it is cut through to the wires from the side 1878 is possibly three or three and one-half inches, located about the center of the sample.

Q. 12. Will you kindly mark with ink your initial on the bottoms of these samples?

A. I will and do.

The notary is requested also to mark each of the samples with his initials and also the number of the sample as appears by the tags thereon.

The exhibits are marked as requested.

Adjourned to 1:45 P. M.

Met pursuant to adjournment. 1879

Q. 13. You say that when the tire are put on sufficiently tight that they do not travel and therefore do not cut in the bottom. You may state whether or not you used anything at any time to prevent this traveling and with what result?

A. We did. We used two different devices to try and keep the tires from traveling. One device we called a burr, which was sometimes held in place by the bolt which bolts the steel channel onto the wood rim and sometimes by screws. We also tried what we called a plate. It was fastened on with screws. In each case 1880
they had points or beards standing up from them to help hold the tire from traveling by sticking into the same. These would hold the tire and keep it from traveling providing the tire was put on sufficiently tight, but where it was not put on sufficiently tight they would not hold it and as this was the case without the burrs or plates, that is, if the tires were put on sufficiently tight they would not travel, we abandoned the use of them. The only difference between the burr and the plate was in their sizes, the burr being about three-quarters of an inch in diameter, and the plates being from two to three inches long by one to one and one-half inches wide according to the 1881
sized tire they were intended for.

Q. 14. Go on and state how you come to use these devices?

A. We always had more or less trouble with our tires traveling and more especially after we had so many branches established, it being impossible for us to watch or inspect each tire that was put on and some of our employees would put the tires on too loose for the reason that it was easier to put them on loose than on tight and it was suggested by one of our employes at the New York office to rough the bottom of the channel in some

1882 way, and it was also suggested by one of our Boston men to put something in the bottom of the channel to keep the tire from creeping. After hearing these suggestions I studied over the matter quite considerably and the burrs and plates were the result. It was always my opinion that to have the tire creep slightly was, a benefit and I am still of the same opinion. The great trouble has been and is to regulate the creeping. You either get too much or not any. Between the two evils, if such it can be called, too much creeping is decidedly the worse. Therefore we have given instructions to all our branches and licensees to put on the tire as tight as possible, so that it
1883 is tight enough to keep it from traveling.

Q. 15. What has been the result of your instructions so far as preventing the creeping of the tires?

A. We have entirely overcome the creeping of the tires.

Q. 16. You may state whether or not in doing this you have in any way changed the construction of your tire from the exhibit "Complainant's Exhibit Complainant's Regular Tire" or from the construction set forth in the patent in suit?

A. We have not.

1884 Q. 17. I call your attention to the testimony of defendant's witnesses Stapleton and Aldrich where they testify in substance that they have overcome this creeping by the use of a special form of corrugated channel and rubber made with cavities to correspond. What if anything do you know about this?

A. Personally I know nothing of anything of the kind. I have seen some of their tires taken off recently, but they showed nothing of this kind. I have heard that they tried something of this kind and afterwards abandoned it.

Defednant moves to strike out the latter part of 1885
the answer on the ground that it is hearsay, and the whole of the answer on the ground that it is incompetent, irrelevant and immaterial; also those portions of answer to Q. 14 wherein the witness purports to state what was suggested to him by some of their men in Boston and New York on the same grounds.

Q. 18. From your knowledge of the rubber tire business and your experience, what would you say as to the practicability of such a device as referred to by the defendant's witness for preventing this creeping or travel- 1886
ing?

Objected to as wholly immaterial, irrelevant and incompetent.

A. I do not think it would be a success for these reasons: The corrugations, in order to be of any service, would have to at least an eighth of an inch high; then in the mode of putting on the tires the retaining wires would have to be at least one-eighth or three sixteenths above these corrugations. This would be necessary in order to have sufficient compression of rubber under the wires and over the corrugations to allow you to get the tire on, and this in my opinion would make a defective 1887
tire for the reason of the holes being too high and I believe the retaining wires would have a tendency to cut through over the corrugations.

Q. 19. I call your attention to the witness Stapleton's answer 3 where he says "for some time we used the system of electric welding for joining the ends of wires but found it objectionable for the reason that only a soft wire can be successfully welded by electricity and the soft wire is elongated when the wheel is in use from the knocks or bumps it gets in passing over obstructions like paving stones; also that in making the joint the ends of

1888 the wires are upset increasing the size of the wires at the joint frequently 100 per cent;" and again, further along in the answer where he says: "We unite the ends of the retaining wires by twisting them each way from a central point making a very firm joint, weaking the wire but a very little and we are thus enabled to use a wire of great tensile strength, consequently one of smaller diameter. . . . For some months we have used this joint exclusively and find it to be the best thing we have tried," and ask you to state what if anything you know about the matters therein stated and from your experience in the rubber tire business state how you agree or differ
1889 from the conclusions reached by this witness.

A. As far as my knowledge goes there is no one of the several concerns putting on wired-on tires that uses what is known among wire-mill men as soft wire. The wire that is generally used is called "market" wire, which is neither a hard nor a soft wire. Soft wire, as I understand it, is wire that has been annealed after it has been drawn to size. Market wire is just as it is drawn. Hard wire is either made hard by drawing cold after it has been drawn nearly to size while hot and it can be made still harder by having it higher in carbon or higher in
1890 phosphate. As far as I know and it is generally spoken of among electricians or men posted in the use of electricity that any kind of metal or quite all metals can be welded by electricity providing of course the welding machine is made suitable for the different classes of welding it is supposed to do. As far as the wire being stretched or being bumped in its passage over obstructions like paving stones, I think I fully expressed my opinion on this score in one of my former answers.

As far as the right and left twist is concerned, as far as I know I was the originator of this kind of a joint in a rubber tire, getting it up and using same in either

the year '85 or '86, and I also tried at that time to get 1891
a patent, which the Patent Office would not allow as they claimed that there was no invention in it, as I remember. When the complainant in suit first started in business they used this same twist, but abandoned it for the electrically welded joint, considering the welded joint much the best. As far as the welding joint being twice the diameter of the wire the weld is made in, this is entirely unnecessary and very seldom occurs and never occurs only through carelessness of the operator. An electrically welded joint properly made will never be more than twenty-five per cent larger in diameter than
the diameter of the stock it is made in and it is then 1892
much stronger in the weld than the wire or stock itself, wherein a twisted joint is always weaker than the wire it is made from and this weakness always occurs where the twist ceases, or in other words at each end of the twist, and I think it is very easy to see why this is so for you cannot bend iron or steel, and I mean by that to have it stay where you bend it, which would have to be the case in making the twist, without separating some of the molecules of steel or iron. If you did not separate these small particles composing the metal it would not stay as bent. For instance, in a piece of spring steel 1893
or spring brass or anything of that nature, in bending the same within its elastic limit it will immediately on releasing the same spring back to its original position. This is so from the fact that you did not change the particles of metal forming same in relation one with the other, but as soon as you do bend them beyond their elastic limit then you change the molecules in relation one to the other which causes it to stay practically speaking where bent or in the position bent. This is also the case in making a twisted joint—you separate or change the relative position of the small parts forming the wire one

1894 with another and therefore weaken the same, for this is just what occurs when over-straining a piece of metal, and if it is carried far enough the metal itself will separate caused by all of the particles which form the metal being separated one from another at that particular point.

Defendant moves to strike out the answer on the grounds that it is immaterial, irrelevant and incompetent; also that part of it which purports to give the opinions of electricians and men versed in electricity on the further grounds that it is hearsay.

Q. 20. Which makes the largest joint, the electric weld or the twisted joint, assuming both to be properly
1895 made?

A. The twisted joint is much the largest, as it is impossible to make a twisted joint without having it twice the diameter of the wire it is twisted from and the twisted joint may be properly made and be three times the diameter of the wire it is twisted from. The joint I now have in mind being three times, as I remember it, is a right and left hand twist such as used by linemen in putting up telegraph wires.

Q. 21. What advantage is there, if any, in using a small-diameter wire for rubber tires?

1896 A. I do not know of any advantage. In fact we did at one time use a smaller wire than we now use and abandoned it for the larger wire, thinking that the larger wire was better as it was not quite so liable to tear through the bottom of the rubber tire in case of an exceedingly heavy side strain or shock on the tire.

Q. 22. If electrically welded wire is better than a twisted joint and the wire of small diameter is a detriment rather than advantage, how do you account for the fact that the defendants have abandoned the electrically welded wire and adopted a smaller wire with a twisted

joint, as testified to by defendants' witnesses Aldrich and Stapleton? 1897

Objected to as immaterial, irrelevant and incompetent and as it is not the province of the witness to account for the acts of the defendant in increasing or diminishing the size of the wires used by it.

A. I can give no good reason for same unless it was that they were prohibited for using the electric welder by the Thomson Electric Welding Company who own the patents on same.

Defendant moves to strike out the answer on the grounds stated in the objection and on the further ground that the only proof on the subject in the case 1898 is that the defendant was not restrained from using an electrically welded joint, but that it abandoned the same voluntarily for a better and more practical method of uniting the ends of the wire.

The latter part of the foregoing objection is objected to by complainants counsel as an improper statement of what is contained in the record. The attention of the court is called to the evident attempt to mislead in the last answer and its insertion here for that purpose and to lug into the record at this point statements that are incorrect.

1899

Q. 22. Referring to that part of the testimony of defendants' witnesses Stapleton and Aldrich where they testify as to numerous changes and experiments which they made in the shape of their tires, what if anything do you know about this?

Objected to as irrelevant and immaterial and not rebuttal.

A. I do not know how many changes they have made, but I do know of some of them and the ones that I know of were apparently for the object of avoiding the patent in suit if possible, all of which changes they no doubt

1900 found failures, for as far as I know they have abandoned same and are again using the tire like the patent in suit.

Defendant moves to strike out the answer on ground that it is a conclusion and improper and a wholesale attempt on the part of the witness to endeavor to strengthen a weak cause.

Q. 23. I call your attention to the statements made by the defendant's witnesses Aldrich and Stapleton to the effect that in their opinion the success of the modern wire-on tire, and by that they include both complainant's and defendant's, has been due wholly to the quality of the rubber used and ask you to state what in your opinion
1901 the quality of the rubber used in a rubber tire has to do with it, if anything?

A. I have always claimed that the quality of the rubber or of the compound from which the tire was made from had very little to do with the success of the tire and to substantiate that belief and statement we are now renewing tires that we put on when we used what was known to us as the "F" compound, but what was in reality, so the rubber manufacturers inform me, the same compound that was used in the English and DuBois tires.

Defendant moves to strike out the answer, the lat-
1902 ter part thereof, commencing with the words "to substantiate that belief" to the end thereof on the grounds that it is incompetent, irrelevant and immaterial, not rebuttal and the latter part of it the additional ground that it is hearsay.

Q. 24. Are you still using this same kind of rubber in your rubber tires that you have referred to as the "F" compound?

A. We are not.

Q. 25. Why did you make the change?

Objection as to improper cross-examination.

A. The change was made through the instructions of

our Mr. Kelly, who thought that the present compound would wear a little longer than the other, but I have never been thoroughly convinced that it is any better. 1903

Defendant moves to strike out the answer on the grounds that it is incompetent, irrelevant and immaterial, and on the further grounds that what Mr. Kelly's instructions were is hearsay and that what Mr. Kelly thought is of no importance whatever in this case.

Q. 26. So far as your experience and knowledge goes in the use of each of these different qualities of rubber in the making of your tire, you may state what effect, if any, it has had on the success of your tire? 1904

Objected to as not rebuttal, incompetent, irrelevant and immaterial, that it calls for a conclusion and the witness should only state facts.

A. My experience has been that the so-called "F" compound would wear down to the edges of the steel channel, and I do not remember of a case where this tire wore out at the bottom or the wires cut through the bottom. I also do not remember of a case where they split out on the side in our present shape tire, that is, splitting into the wire. On the other hand, the present compound possibly would wear longer as far as actual wear is concerned before it would wear down to the edges of the steel channel, but in doing so it often chips out in small small pieces along the edge of the steel channel caused by being overloaded and being nipped off between obstacles in the street and the edge of the steel tire. I cannot say that this materially effects the life of the tire, but it does effect the appearance of the same. The "F" compound was a trifle harder rubber than the present compound and therefore was harder to overload, or in other words would carry a larger load without being squeezed over the sides of the steel chan- 1905

1906 nel. I have often made the remark and believe that we would have obtained greater results, if such is possible, and by that I mean we would have avoided some of the complaints we have had of our tires getting chipped out along the edges by our customers, which would have been in a way obtaining better results, if we continued using the "F" compound.

Defendant moves to strike out the answer on the grounds that what the witness has often remarked is incompetent and immaterial and not evidence.

Q. 27. Do you know anything about the tires which were put on by the complainant in 1894 for Henry Erter,
1907 Dr. Miller, Dr. Niles, Mr. Corry, Mr. J. S. Elliott of this city, and if so, state which of these compounds were used in these tires, what you call the "F" compound or the present compound?

Objected to as wholly incompetent, immaterial and irrelevant and as not rebuttal.

A. I do remember the tires spoken of very distinctly, as most of them were renewed in a very short time after they were put on caused by no fault of the compound, and they were all of what we know as the "F" compound.

Q. 28. I call your attention to "Complainant Exhibit
1908 Erter's Old Tire" and ask you to state what compound that is made of?

A. They were of the "F" compound and were put on about August or Sepember. At about that time there were two sets of inch and one-half tires put on by the complainant. One set was put on a coal wagon for experimental purposes only and lasted as I remember about a year and of course they were put on at complainant's expense. The other set was put on Dr. Erter's hack and run until some time last Fall; they being the first two sets or in other words they being the first inch and one-half tires put on by complainant.

Defendant moves to strike out the answer on the grounds stated in last objection noted. 1909

Q. 29. Which of these tires did you refer to as having been renewed a short time after having been put on?

A. Dr. Miller's tire was put on originally of a tire we first made when going into business which was nearly a square tire and was put on I think in April or May of 1894. They only lasted two or three months. He brought them back and we replaced them with a set of the tires we are now using which is like the patent in suit.

Defendant moves to strike out the last answer because it is immaterial, irrelevant and incompetent and not rebuttal. 1910

Q. 30. My question 27 meant to refer only to the tires made like the patent in suit and not to the first or experimental tires such as you testified to in your first deposition. The question which I now ask is from which of the compounds were the tires sold in 1894 to the parties mentioned, I mean the tires like the patent in suit?

Same objection.

A. They were all made from the "F" compound.

Q. 31. I call your attention to the deposition of Dr. Niles where in testifying as to the use of your tires he says in answer to Q. 4: "The first set placed on my wheels being an experimental set and lasted about three months." You may state whether or not the tire referred to was a tire like the patent in suit? 1911

Objection to same as before.

A. The rubber tire was the same as the patent in suit, but the steel channel was not. These tires were put on from some of the first rubber that was received from the rubber company made after the pattern like the patent in suit, which was as near as we could see about it should be. We had also just received a small shipment of steel channel from the rolling mills submitted to us for our

1912 inspection before going ahead and rolling our complete order. The steel channel submitted was everything but what it should be. One flange being very much too low and both flanges being very much too thin, being almost a knife edge. The outside width of the steel channel was about what it should be, but the flanges being so thin it made the inside of the channel much wider than it should be. These wheels of Dr. Niles called for ⅞ tire and we equipped them with ⅞ steel channel, using this steel channel just spoken of for the reason that Dr. Niles was very anxious to get his rubber tires and [illegible] were very
1913 anxious to try the new-style tire, but when we come to put the rubber tire on the wheels we found that it did not begin to fill the steel channel on account of the inside of the steel channel being much too wide caused as stated by the steel flanges being too thin so we decided to put an inch rubber tire in the ⅞ steel which was about as much too large as the ⅞ rubber was too small and we had to force or press the rubber into the channel. This caused it to squeeze out over the edge of the steel flanges by the slightest load. Even the load of the empty vehicle would cause it to do so. This caused the tire to scalp off in a very short time. I think possibly it lasted two or three
1914 months. When we replaced them with a ⅞ steel channel properly made, which in the mean time we had received from the rolling mill and a ⅞ rubber tire of the same make and compound as the first one. This set of tires I am quite sure gave satisfaction, as I do not remember of hearing anything from them.

Defendant moves to strike out all of the answer from the reasons stated in the objection and all the various parts and parcels thereof that purports to state the anxiety of Dr. Niles and others and also what the witness thought and all the odds and ends of improper and incompetent statements on the

grounds that they are not evidence for any purpose. 1915

Adjourned at 5 P. M. to meet at 10 A. M. Thursday, Aug. 11, 1898.

Counsel for defendant protests at this early adjournment.

Met pursuant to adjournment; present same as yesterday.

Q. 32. You mentioned in your testimony the fact that you had a number of branches and places of business in the United States. Will you please state how many such places of business your company has established and where they are located? 1916

Objected to as not rebuttal and on the ground that complainant's witness Kelly in the *prima facie* proofs answered the same question; also that it is incompetent, irrelevant and immaterial.

A. We have nine branches, the home office being located at Springfield, Ohio, one branch at New York City, Boston, Mass., Chicago, Ills., Philadelphia, Pa., St. Louis, Mo., Cleveland, Ohio, Pittsburg, Pa., Cincinnati, Ohio, and there is one just recently located in the East that I can't place positively. The licensees are about twenty-four in number, being located at San Francisco, 1917 Los Angeles, Amesbury, Mass., Albany, N. Y, Louisville, Ky, Dayton, Ohio, Bativia, N. Y., New Haven, Ct., Rochester, N. Y., Detroit, Mich., Indianapolis, Ind., Kansas City, Mo., Nashville, Tenn., Minneapolis, Minn., Des Moines, Ia., Baltimore, Md., Atlanta, Ga., Dallas, Texas, San Antonio, Tex., New Orleans, Richmond, Va., Norfolk, Va., and two in Columbus, Ohio. All of the licensees pay a royalty of 10c per pound of rubber used.

Q. 33. Mr. Aldrich, defendant's witness, in answer to Q 45, names the following as being engaged in putting on "hard-rubber wired-on tire," to wit, Rodgers of

1918 Springfield, Ohio; The Victor Rubber Tire Co., Springfield, Ohio; Whitman & Barnes, Akron, Ohio; Calumet Rubber Tire Co., Chicago; Firestone-Victor of Chicago; Michigan Rubber Tire Co., Kelley, Maus & Co., The India Rubber Tire Co., of Akron, The Finley Rubber Tire Co., of Atlanta, Ga.; also he says: "there was a Cushion Tire Wheel Co., Columbus, Ohio. They have gone out of business I think on account of the dissolution of the firm."

Please state if you know, what tires these different companies are making?

1919 Objected to as wholly incompetent and irrelevant, and if competent at all should be confined to the time intended to be included in the answer of the witness Aldrich, subsequent changes being wholly immaterial.

A. They are all with the exception of Rodgers of Springfield, Whitman & Barnes of Akron, Michigan Rubber Tire Co., of Chicago, using the same tire as shown and described in the patent in suit, and also shown in the two samples marked "Sample of Defendant's Tire of October 1896" and "Sample of Defendant's Tire of August, 1897."

1920 Q. 34. How about the Cushion Tire Wheel Co., of Columbus? Do you know anything about their going out of business?

Objected to as wholly irrelevant and immaterial. not rebuttal.

A. We brought suit against them and shortly after they settled with us and ceased the business.

Q. 35. What about the Finlay Rubber Tire Co., of Atlanta, Ga.? What tire are they now making? State anything you know about their manufacture of rubber tires?

Objection to same as before.

A. We brought suit against them, they finally settling with us and taking out a license for the use and manufacture of our tires. 1921

Q. 36. If you know you may state what kind of tire they were using at the time the suit was brought if it had any special name.

Objected to same as before.

A. They were using what was generally termed the "Victor" tire and is shown in sample marked "Sample of Defendant's Tire of October, 1896." I do not mean by that that this is a sample of their tire, but a sample of the style of tire they used.

1922

Q. 37. What were the Rodgers, Whitman & Barnes and Michigan tires?

Same objection.

A. The Michigan tire—that is, the rubber tire—was round in cross-section and held on by one retaining wire. The Rodgers tire was of the same shape with the addition of a rubber cushion underneath the rubber tire. The Whitman & Barnes tire was the same tire and I understand they are licensees under the Rodgers patent.

Defendant moves to strike out the answer on the grounds stated in the objection and on the further grounds that the witness's understanding is not evidence. 1923

Q. 38. Defendants have also referred in the record on a number of occasions to a rubber tire called the "Imperial;" also to one called the "Batavia" the "Hartford," and I think also to a wired-on tire made by Lockwood & Brown. State what you know about these different tires, if they are different tires?

Same objection.

A. There is no difference in the tires, they all being the same tire as described in the patent in suit, the only difference being in the name. The tires are sometimes

1924 called by the names of the parties who make them. We brought suits against all of these parties named and the Batavia Wheel Co. settled with us and took out a license; also did Lockwood & Brown of Amesbury, Mass. The Kelley-Maus and Imperial are one and the same. The Kelley-Maus people making a branch business of their rubber tire business and calling it the Imperial.

Q. 39. I notice that defendant's witness Aldrich in another answer refers to the Standard Rubber Tire. What is this?

A. The only Standard Rubber Tire that I know of is
1925 one of New York City, against whom we also have a suit now pending.

Q. 40. State whether or not you have also brought suit against the Victor Company?

A. We have brought suit against the Victor Rubber Tire Co., of Springfield, Ohio, in which they have delayed matters considerable, and the courts have compelled them to put up an indemnity bond.

Defendant moves to strike out the answer on the ground that it is incompetent, immaterial and irrelevant and not rebuttal and not evidence for any purpose.

1926 Q. 41. You may state whether or not you have brought suit against the other parties who you say are making the same kind of tire as shown in the samples referred to and set forth in the patent in suit?

A. We have.

Q. 42. Please state what list price you placed on your inch and half tire when the same was first introduced in New York?

A. $100.00

Q. Have you a catalogue or price list which was used by you at the time you introduced your tires in New York?

Objected to as immaterial and irrelevant, the price at which they were actually sold being the important feature of the matter and not a listed price that was not adhered to. 1927

A. I have.

Q. 44. Where is it?

A. I can produce it and do.

Q. 45. In this catalogue in which the pages are not numbered but which I have numbered in ink from 1 to 16, will you please designate the price list you have referred to. The price list is on Page 11 of said catalogue.

Q. 46: Page 11 is as follows: 1928

PRICE LIST.

These prices include the steel and rubber tires put onto wheels furnished by our customers.

¾	inch	tread	for	set	of	four	wheels.....$30.00
⅞	"	"	"	"	"	"	..... 40.00
1	"	"	"	"	"	"	..... 50.00
1⅛	"	"	"	"	"	"	..... 65.00
1¼	"	"	"	"	"	"	..... 75.00
1½	"	"	"	"	"	"	.....100.00
1½	"	"	"	"	two	Hansom	..... 65.00

Have these prices since been changed and if so state why they have been changed? 1929

The question is objected to as an improper way to put any portion of the catalogue in evidence, the document itself being the best evidence of what its pages contain, and is incompetent for any purpose and not the proper way to rebut the evidence of the half dozen witnesses who have testified that the selling price of complainant's tire when introduced in New York City was $85.00 for this inch and half size.

A. These prices were changed for the reason that when we added several more sizes of tire to the list we

1930 found the prices very much out of proportion and some of these original prices were lowered and some of them raised still higher.

The catalogue referred to is marked for identification "Complainant's Early New York Catalogue." Page 11 with the price list referred to is offered in evidence and marked "Complainant's Exhibit, Early New York Price List."

Complainant also offers in evidence the two samples of tire referred to the witness, which have heretofore been marked and identified in the case and
1931 they are now marked "Complainant's Exhibit Sample of Defendant's Tire of October, 1896" and "Complainant's Exhibit Sample of Defendant's Tire of August, 1897;" also the sample heretofore identified by the defendant's witness Cooper and marked and entitled in the case, the same to be now marked "Complainant's Exhibit, Modified Form of Defendant's Tire;" also the two samples of rubber heretofore marked and identified in the case in the deposition of defendant's witnesses Cooper and Holt, the same having heretofore been marked "Complainant's Sample of Old Tire A and B," respectively,
1932 and they are now marked "Complainant's Exhibit, Complainant's Sample of Old Tire A" and "Complainant's Exhibit, Complainant Sample of Old Tire B."

Defendant objects to the marking of the catalogue as requested and to the receipt in evidence of Page 11 thereof as being improper, incompetent and immaterial and not rebuttal, and objects to the receipt in evidence of the alleged samples of defendant's tire on the ground that it does not appear that they or any tires like them were ever adopted or used by the defendant, but on the contrary the actual tires

used by the defendant or samples thereof have been stipulated into the case heretofore and marked "Complainant's Exhibits" "A" "B" and "C" and agreed upon as representing the alleged infringing devices. 1933

Defendant further objects to the receipt in evidence of the alleged samples of "Complainant's Old Tire marked respectively "A" and "B" on the ground that they have not been identified as parts of complainant's tire and objects to the receipt in evidence of any and all of the alleged samples as incompetent irrelevant and immaterial and as not rebuttal. 1934

Complainant's counsel in view of the above calls attention to defendant's testimony as follows: Stapleton's X-A. 48 Cooper's X-A's. 89 to 100, also X-A's. 111 to 113.

Complainant's counsel also offers in evidence as "Complainant's Exhibit Sketch Defendant's Defective Tire" the sketch heretofore referred to and marked as above in the deposition of defendant's witness Stapleton.

The complainant further calls attention to the depositions of complainant's witnesses Hoffman, Jones, Kelly and Grant in the *prima facie*. 1935

Defendant objects to the receipt in evidence of the alleged sketch as it not only does not appear to be a correct illustration of any tires ever used by defendant, but on the contrary it is a very clumsy attempt to imitate a tire that was never used or adopted by the defendant except in a few cases of emergency and that it is incompetent for any purpose, irrelevant and immaterial and not proper in rebuttal.

Q. 47. I call your attention to the defendant's witness Stapleton where in answer to Q. 4 he makes the follow-

1936 ing statement: "It is my judgment that the tires of both the complainant and the defendant as they were applied at the time of this suit was brought for a long time afterward were an absolute failure and would not satisfy the public for any length of time. They were so defective and caused so much trouble to the users that the public was growing dissatified with the tire and carriage builders in particular did not hesitate to denounce and ridicule them because of these defects and troublesome features" and ask you what you have to say as to the correctness of this statement.

1937 A. I consider that statement entirely wrong for we have within the last year replaced a number of tires that were put on at and before the time this suit was brought and as far as the carriage makers being dissatisfied, that might be so in a way. They talked against the tire not because of its poor wearing qualities or of its being defective, but on the contrary because it increased the life of the vehicle so much and so greatly reduced their repairs on vehicles, they claiming that it greatly reduced their repair business and opposed the tire on those grounds.

Q. 48. Does this last answer apply to both complainant's and defendant's tires?

1938 A. As far as I know it does. I am more familiar with the complainant's.

Q. 49. If the defendant has experienced such trouble as the witness Stapleton refers to, how do you account for it?

Defendant objects to this attempt to inject the theories of the witness and his speculations into the case on the ground that it is improper, irrelevant and incompetent.

A. I cannot account for it unless it be that the tires were mechanically defective or poorly applied.

Cross-Examination by Mr. Stapleton: 1939

X-Q. 50. Are you the vice-president of the complainant corporation and a stockholder therein?

A. I am.

X-Q. 51. Have you been a stockholder since its incorporation?

A. I have.

X-Q. 52. Did you at any time change your method of putting on tires? If so, when?

A. I can't say that we changed the method of putting on the tires farther than to adopt a plan to put them on as tightly as possible, tighter than we usually did when 1940
first putting on these tires. That plan was adopted I think sometime in the middle of last year.

X-Q. 53. Do you mean by that that it was put into practice by the middle of last year?

Objected to as irrelevant and immaterial inasmuch as the patent in suit does not relate to the particular method of applying the tire but to its mechanical construction.

A. It was about one year ago that we decided that what trouble we were having with the tire was caused by it being put on too loosely. We at that time decided to 1941
put them on as tight as possible and from that time watch this feature of the business a great deal closer than before and I expect it would be said that we adopted it at that time.

X-Q. 54. Describe the method used by you in applying your tires up to the time you adopted the new plan?

The question is objected to as irrelevant and immaterial and the witness is instructed that he may use his judgment about disclosing the methods employed by complainant in putting on its tires.

A. I would not care to state what this method is or

1942 was, for it was practically the same as we are now using and a great many of the features are identically the same and as our experience has taught us that some of the minor features assist in more rapidly and easily putting on tires and if I should explain this method it would give our competitors the benefit of our past experience in this respect.

X-Q. 55. Prior to the time you adopted the new plan did you first form the tire into a hoop, and afterwards seat it in the channel by stretching it over the flange with tools for that purpose?

1943 The question is objected to for the reasons before stated and the witness instructed as before. The question is further objected to on the ground that there is no evidence there has been any "new plan."

A. I would rather not answer that question for the same reasons given in my last answer.

X-Q. 56. Do you decline to answer?

A. I do.

X-Q. 57. Did you take out a patent in the United States for machinery or tools to be used for putting on tires by stretching them over the flange after being formed into a hoop subsequent to the time when you be-

1944 gan the sale of rubber tires?

Objected to as irrelevant and immaterial and also as incompetent, as any patent or patents which the witness may have taken out are the best evidence of what they contain.

A. I believe I did take out a patent several years ago on a device for that purpose and I also believe that the defendants are using it or something similar.

The defendant moves to strike out the latter part of the answer as not responsive, and the belief of the witness is not evidence.

X-Q. 58. In your new plan of applying tires do you

draw up the wires in the flanges and fasten them without throwing or stretching them over the flanges after the ends of the wires are united? 1945

Last objection and instructions repeated.

A. I decline to answer that question.

X-Q. 59. You have mentioned two devices used by you in your efforts to prevent traveling of the rubber in the channel. Did you at one time resort to the plan of cementing or sticking the rubber to the channel for this purpose?

A. We used cement at one time, but not for the purpose of keeping them from traveling, but for the purpose of preserving the canvas on the lower side of the rubber and to assist in keeping the rubber tire from tipping over in the channel. The witness at that time thought that it was a benefit to allow the tire to creep slightly and still thinks so, and, as stated before, this cement which was nothing more than common shellac, which was put in there for the purpose stated. 1946

X-Q. 60. When did you abandon the use of the shellac?

A. We discovered some three years ago probably that the shellac was of no particular benefit, but still we could not see that it done any harm and we instructed our branches that they could use it or not just as they chose, and I could not state when they all abandoned using it. 1947

X-Q. 61. When did the New York and the Springfield plants stop using it?

A. I think the Springfield office abandoned using the same possibly eighteen months or longer ago. I cannot state when the New York office abandoned the same, but cannot recall seeing them using it for the last eighteen months or two years.

X-Q. 62. Are the three principal types of rubber tire

1948 now used in this country on vehicle wheels known as the solid, cushion and pneumatic rubber tires?

A. I cannot call them the three principal tires for I know of no others.

X-Q. 63. Are you reasonably familiar with the construction of the tire called the cushion rubber tire and the pneumatic rubber tire for vehicle wheels?

Objected to as irrelevant and immaterial, and all questions relating to cushion and pneumatic tires or their use and construction are by consent objected to once for all in this objection on the same grounds.

A. I think that I am.

1949

X-Q. 64. Have those two kinds of tires been used in this country on vehicle wheels since 1892 or '93 and I mean to include under the term "cushion" tire the round rubber tires?

A. I think that they have in a small way.

X-Q. 65. Has the use of penumatic rubber tires for vehicle wheels steadily and largely increased in this country since 1892 or '93.

A. I do not think so, for as far as I know there never was but a very few of them made.

X-Q. 66. Has the use of the round or cushion tire
1950 steadily and largely increased in this country since 1892 or '93?

A. I do not think so, but on the contrary I think that there are fewer of them used to-day than there were two or three years ago?

X-Q. 67. Then you think that the use of both pneumatic and cushion, or round rubber tires, has not increased since 1892 or '93?

In addition to the last objection, all of these questions are further objected to on the grounds that they are incompetent in cross examination, not relating in any way to the direct examination, and this

objection is made by consent to apply to all this line of cross examination. 1951

A. I do, and when I say that I mean for use on vehicles—not bicycles and tricycles.

X-Q. 68. You have testified in regard to defendant's exhibits Kelly's Samples Nos. 3, 5 and 7, that they traveled in the channel, and that that was the cause of the cutting through of the wire, and also that in your judgment the wires do not travel, but remain stationary with reference to its location or position in the steel flanges. Do you mean that the rubber in these cases slips around in the channel?

A. I do. We generally speak of it as "creeping" around in the channel. 1952

X-Q. 69. And that in your judgment is what caused the cutting through of the wires on these three samples and also on No. 6?

A. It was as far as the three samples are concerned but in No. 6 sample I doubt whether that is a piece of our tire, but if it was a piece of our tire it is a defective tire, and this defect would have its bearing in not being able to properly put on the tire.

X-Q. 70. Defendant's witness Cooper in X-A. 49, states with reference to these samples, "No. 3" and "2," were on a hansom cab; the other four were on a brougham. I call your attention to sample "No. 3" and ask you if that is the size usually used on hansom cabs? 1953

A. No. 3 might possibly have been used on a hansom cab, but as near as I am able to judge it is of a lighter tire than is generally used on hansom cabs.

X-Q. 71. I show you "Defendant's Exhibit, Kelly Band Iron" and ask you if they represent the device you have described as used to prevent the creeping of the tire?

A. Only one of these samples represents the so-called

1954 band iron used by complainant so far as my knowledge goes.

X-Q. 72. Which one of the four handed you do you refer to?

A. The one measuring 1¼ inches wide by 5 inches long and having eight prongs or beards on each end, this being the larger of the two sizes we used.

X-Q. 73. I show you some iron spurs with two pieces of rubber and ask you if those spurs correctly represent the other non-creeping device you mentioned and if the two pieces of rubber tire there evidence of having been used with these spurs or similar devices?

1955

A. The spurs or what we termed "burrs" are I expect some made by our company, but are not in the condition now as when used. The hooks or beards on these samples either being straightened out or broken off. The two samples of rubber spoken of show signs of having something of the kind done to them, as the imprint is quite plain on the canvas.

X-Q. 74. The wearing off or flattening down of these beards indicates that they had been used, does it not?

A. I should say so, but the same effect might possibly occur by the burrs laying on the floor and being trodden

1956 on.

X-Q. 75. When a rubber tire used with these burrs traveled in the channel, what effect was produced on either the rubber tire or the burr?

A. The effect would be to injure the tire as well as flatten out or break off the beards.

X-Q. 76. How injure the tire?

A. If the beards did not straighten out or break off and the tire traveled over them, it would have a tendency to cut the tire on the underside.

X-Q. 77. Did you often find this condition when using the devices?

A. I can't say that we often found it, but it would occur whenever the tires were put on too loosely, which some of our workmen were apt to do, as it was much easier to put them on loosely than tightly. I never knew of a tire traveling where it was put on sufficiently tight either with the two devices spoken of or without them. 1957

The burrs and the two pieces of rubber referred to are attached marked "Defendant's Exhibit Complainant's Non-creeping Device and Rubber Used Therewith" for identification.

X-Q. 78. What kind of rubber or compound of rubber do you find the two pieces to be? 1958

A. It appears to be the same compound, as near as I am able to judge, that we have used ever since abandoning what is known as the "F" compound.

X-Q. 80. How is the wearing of a rubber tire affected when it is not allowed to creep at all?

A. Do you mean by that the life of the tire?

Q. 81. Both the life and the effect on the tire?

A. A tire that is not allowed to travel in the rim is more liable to be overloaded than one that is allowed to travel, but the one that is allowed to travel may travel excessively and thereby not wear any longer than the one that is not allowed to creep. In my opinion, if the creeping could be regulated, a tire that creeped slightly, everything else being equal, would give the best result. 1959

X-Q. 82. Who did you hear say that defendant had abandoned the use of its corrugated tire?

A. I cannot recall just now who it was that told me, but as I remember it I heard it several times on my last visit to New York City, which occurred two weeks ago.

X-Q. 83. Did you not also hear that it had been a perfect success and that large quantities were being placed upon the market?

1960 Objected to as irrelevant, incompetent and immaterial.

A. No, sir, but on the contrary I understood that they abandoned it as a failure.

X-Q. 84. I suppose your agents or employees told you this, did they not?

Same objection.

A. It is quite likely that they were one of my informants, as it would be quite natural for them to keep posted as much as possible in everything pertaining to their own line of business.

1961 X-Q. 85. Is it also quite natural for them or many of them to state in your presence anything that they had previously understood you would like to have them say, so that you could truthfully testify to having heard something said, although you have every reason to believe the statement was incorrect?

Same objection.

A. No, sir, that is not the case.

X-Q. 86. In your rubber tire, does the wire completely fill the hole when applied to the wheel?

Objected to as irrelevant and immaterial.

A. Not quite.

1962 X-Q. 87. In increasing the size of your wire in your tire, did you also increase the size of the hole?

A. When we changed the shape of our tire from what we called the square tire to the present shaped tire, we also changed the size of the wire on the ¾, ⅞ and inch sizes to a little larger wire, these tires being the only ones we made in square tire. I think also that when we first made the 1½ inch tire of the present shape it has a trifle larger wire than it now has and it was changed immediately after making the first few tires.

X-Q. 88. Why was that wire reduced in size?

A. We thought that it was a little larger than neces- 1963
sary.

X-Q. 89. Necessary for what purpose?

A. Larger than necessary to retain the rubber tire in steel channel under all circumstances.

X-Q. 90. Have you experienced much difficulty or trouble with the breaking of the wires when in service on the wheels?

A. No, sir, we never did, not even when we were using the small wire.

X-Q. 91. What sizes of wire do you use in the different sizes of your tire and state the gauge?

1964

A. No. 10½ in ¾, ⅞ and inch tire; No. 9 wire in the 1⅛, 1¼, and 1⅜ inch tire; No. 8 wire in the 1½, 1⅝, and 1¾ and 2 inch tires; No. 7 in the 2½ inch tires. The gauge is Washburn & Moen.

X-Q. 92. What was the maximum strength of the wire used by you in your 1½ inch tire?

Objected to as irrelevant and immaterial.

A. I have no means of stating definitely, as I never made the test, but if I was to make a guess I would say 2,000 pounds tensile strength.

X-Q. 93. What in your judgment is the maximum strain that would come upon the wire used in an inch 1965
and half tire?

Last objection repeated.

A. That would be very hard to state, but under ordinary circumstances it would be small. I should think under some circumstances it might go as high as 500 pounds.

X-Q. 94. Well, in ordinary use in cities, going at a rapid pace round corners, in and out of car tracks, and such uses as it ordinarily gets, what would you think would be the maximum strain the wire would receive?

1966 A. Oh, I have no way of forming an opinion, but guessing at it would say possibly 300 or 400 pounds.

X-Q. 95. Do you regard the method of fastening your wires as one of the important features of your tire?

A. Only so far as the equipping of the tires to the wheels is concerned.

X-Q. 96. Is the application of the tire to the wheel regarded by you as an important feature?

A. Only in that it no doubt will last longer and possibly wear better in a tire that is properly put on than one that is not properly put on.

1967 X-Q. 97. Which do you regard as the weakest part or feature of your tire?

The question is objected to as irrelevant and incompetent.

A. I do not consider that the tire has a weak point or feature for we have been using the tire for several years as it now is made and if I considered or thought that any part of it was weak I should certainly have taken steps to remedy it.

X-Q. 98. Was your company sued for alleged infringement in electrically welding your wires or for using apparatus for that purpose by the Thomson-Houston Co.

1968 or any other?

Objected to as irrelevant and immaterial.

A. Not that I ever heard of.

X-Q. 99. Who connected with your firm or company did the Thomson-Houston people sue?

Last objection repeated.

A. No one that I know of.

X-Q. 100. Was your company or any one connected with it sued at any time either for welding the wires by electricity or for using devices for so doing?

Objected to as irrelevant, immaterial and incompetent.

A. Not that I know of. 1969

X-Q. 101. I call your attention to "Complainant's Exhibits A and B" and ask you if you include them in the statement heretofore made in your testimony when you said in substance that the defendant's tires were like complainant's?

The question is objected to as wholly incompetent in cross-examination, being new matter not touched upon in any way in the direct examination and on the further ground that this witness testified in the *prima facie* case and the same counsel has an opportunity to cross-examine him and did cross-examine him at length, and complainant's counsel moves to strike out the question and all questions and answers relating to said exhibits in this cross-examination. 1970

A. I did not include them samples in my statement as I do not remember of ever seeing tires put on by defendant like these samples and especially exhibit A.

X-Q. 102. Are they like your tire and the tire described in the patent in suit in all essential particulars and features?

Last objection repeated and complainant moves to strike out the question for the reasons stated.

A. They are in all essential features with the exceptions possibly in Exhibit A, which has the angle formed by the exposed and unexposed sides slightly above the periphery of the flanges. 1971

X-Q. 103. Do you know who constituted the Cushion Tire Wheel Co. of Columbus, Ohio, at the time they went out of business.

A. I do not.

X-Q. 104. Did not this Cushion Tire Wheel Co., of Columbus cease doing business in rubber tires before you sued them?

A. No, sir, they did not.

956

1972 X-Q. 105. Was not the active manager and party most interested in that company a Mr. Burrows, to your knowledge?

A. I could not state.

X-Q. 106. Do you know this Mr. Burrows?

The question is objected to unless the Mr. Burrows counsel refers to is mentioned.

A. I cannot say. I have met Mr. Burrows once.

X-Q. 107. Do you not know that the Mr. Burrows who was practically all there was to the Cushion Tire Wheel Co. of Columbus is now and ever since you began your suit against his company engaged in the selling of
1973 rubber tires substantially like yours.

Objected to as altogether irrelevant, immaterial and improper in cross-examination and as an attempt to introduce alleged statements of facts unproved and unsupported in the form of questions.

A. No, sir, I do not know this to be so.

X-Q. 108. How much did the Cushion Tire Wheel Co. pay you in settlement of your suit, if anything?

A. I do not remember of ever hearing the amount. Our Mr. Kelly had that entirely in his charge.

X-Q. 109. How long has Mr. Kelly, the president of
1974 the company, been absent and away from the United States at this time?

Objected to as irrelevant and immaterial.

A. I think he sailed on the 2d of June. I am not positive.

X-Q. 110. How much did the Finley Rubber Tire Co. of Atlanta pay you in settlement of the suit alleged to have been brought against them?

A. I do not remember the amount in that case either.

X-Q. 11. Don't remember that you ever heard the sum mentioned do you?

A. No. He was here several days making the settle- 1975
men in conference with Mr. Kelly.

X-Q. 112. Did your company buy out his company, did he then enter your employ, is he still in your employ, establishing agencies or shop-rights for you?

A. No, sir, I never heard of our company buying out his company and he never was in our employ.

X-Q. 113. Has he been at any time and is he now establishing agencies or shoprights for you on commission or otherwise?

A. No, sir.

X-Q. 114. Have you sold Mr. Samuel E. Finley, or 1976
any other Finley, of Atlanta, Ga., and formerly of the Finley Rubber Tire Co., or rented to him any plants or outfits, machinery or tools for applying rubber tires.

Objected to as the witness has already testified that Mr. Finley is a licensee of the complainant company.

A. We have.

X-Q. 115. How many?

Objected to as irrevelant and immaterial.

A. As near as I can recall, we have equipped six plants for his present company.

X-Q. 116. Was his present company organized at or 1977
about the time you made the arrangements with him to sell your tires and tools?

Objected to as there is no proof that any arrangement to sell tools was made with said Finley or his company; that he is a licensee and pays a royalty on rubber tires.

A. I do not remember when the present company was organized, but I think it was after he settled with us for infringement.

X-Q. 117. How much did the Batavia Wheel Co. pay you in settlement of the suit against them?

1978 A. I do not know for I never heard how that case was settled.

X-Q. 118. And never heard any sum mentioned did you in connection with the settlement?

A. No, sir.

X-Q. 119. How much did Lockwood & Brown pay your company in settlement of the suit against them?

A. I do not know the amount, but I do know that we received quite a sum of money, but just how or what the money was to cover I do not know.

X-Q. 120. Who did you receive the sum of money from?

1979 A. I understood that it came from Lockwood & Brown. I did not see the money.

X-Q. 131. Did you understand that it was in payment of damages for infringement or in settlement of your suit?

A. I understood that it was a settlement made with them.

X-Q. 122. But don't know for what purpose?

A. I do not know how it was divided up, what part was for damages and what part for shopright.

X-Q. 123. Do you not know that the money to which

1980 you refer as having been paid you by Lockwood & Brown was paid for material, tools, and in an arrangement by your company with them that they should put on and sell your tire?

A. I understand that a part of it was for that purpose but what part I am not able to state.

X-Q. 124. Prior to this adjustment they had been using tires made by the Hartford Rubber Works, had they not?

A. I understood that that was where they got their rubber.

X-Q. 125. Did the Hartford Rubber Works make a tire that was not successful? 1981

Objected to as irrelevant and immaterial and not proper cross-examination.

A. I do not know that the tire was not successful, but I considered their mode of fastening a failure. I think it quite likely that their tire would have given good satisfaction if properly put on.

X-Q. 126. Did they quit making tires for a time and abandon the rubber tire business so far as making and selling rubber tires?

Objected to as calling for matter obviously incompetent, as based on hearsay and otherwise irrelevant and immaterial. 1982

A. I don't know that such is the case, but I have heard something of the kind.

X-Q. 127. Well, did this occur about the time that Lockwood & Brown commenced to deal with you?

Last objection as to last question.

A. I cannot say, but I think that I heard of it sometime after.

X-Q. 128. Are you now willing to swear that Lockwood and Brown paid your company a single penny in direct settlement of any claims you had against them for infringement? 1983

Objected to as incompetent, irrelevant and immaterial.

A. Not only in so far as has been told me.

X-Q. 129. What effect does heat have on market or soft wire?

A. It anneals it.

X-Q. 130. You mean by that that it makes it softer?

A. It makes it a little softer.

X-Q. 131. And reduces it tensile strength?

1984 A. Just as much as that amount of annealing would cause.

X-Q. 131. When you weld a wire with electricity does the current heat it to a fusing heat?

A. It does at the joint.

X-Q. 132. If you weld by electricity two pieces of wire each a foot long of precisely the same size and strength at every part and apply a strain, where would the break occur?

A. Where it is annealed right aside of the weld, but that strain is nearly the equivalent to a strain that would separate the wire at any point.

1985 X-Q. 133. Does not electrically welding a wire weaken the wire at either side of the point of junction of the metal?

A. It does just in the way I stated in my last answer.

X-Q. 134. In heating a wire to a welding heat, what percentage of strength is lost?

Objected to as irrelevant and immaterial and as incompetent.

A. I do not understand that the welding or heating the wire to a welding heat weakens it only in so far as the annealing has that effect.

1986 X-Q. 135. Don't you know that it is a common rule in metallurgy that the heating of any metal by any means to a welding heat reduces its strength forty per cent?

A. No, sir, I do not so understand it, and, further than that, all refined iron and steel is so made by heating it to a welding heat and working it.

X-Q. 136. I show you two samples of twisted wire and ask you in your judgment where the weakest point of these wires are and what percentage the twisting weakens them?

A. The weakest points in the sample submitted are at the extreme ends of the twisted part and the amount

of weakness here is regulated by the condition of the wire before it was twisted. I mean by that, how hard or soft the wire was. 1987

The samples are marked for identification "Defendant's Exhibit Sample of Defendant's Twisted Joint."

The exhibit referred to or the marking of the same is objected to as misleading and as not being properly identified as there is nothing whatever in the record to identify them as defendant's twisted joint.

X-Q. 137. I show you three short pieces of wire heretofore marked for identification "Three Samples Electrically Welded Wire" and ask you if in your judgment those were welded by electricity? 1988

Objected to as incompetent, as calling for secondary evidence and as otherwise irrelevant and immaterial.

A. There is nothing about the samples to indicate that they were welded by electricity, but if they were they are certainly a very poor job.

X-Q. 138. What time was it you reduced the price of the inch and half rubber tire from $100. to $85.00.

A. I do not remember, but sometime after we opened an office in N. Y. City and also after we had added several additional sizes of tire to our list. 1989

X-Q. 139. You say the courts have compelled the Victor Company to put up a bond of indemnity. Is not that bond of indemnity brought about by the fact that they had procured an injunction against your company to prevent it bringing further suits against the Victor Company's licensees?

A. I do not know that such is the case, but it may be so.

1990 X-Q. 140. Do you not so understand it?

A. I do not.

X-Q. 141. Has the Victor Company enjoined your company from bringing further suits against their licensees.

A. I believe I have heard something of the kind, but just what that is I cannot state.

X-Q. 142. Do you not understand that to be the fact?

Objected to on the ground that the witness has already answered the question as far as he knows and the present question is incompetent.

1991 A. I understand that some such proceedings have been taken, but that is all.

ARTHUR W. GRANT.

Complainant's counsel here offers in evidence a certified copy of a final decree in the case of The Rubber Tire Wheel Co. *vs.* Charles S. Lockwood, *et al.* in the Circuit Court of the United States in the District of Massachusetts, No. 854 in equity, a certified copy of the final decree in the suit of the Rubber Tire Wheel Co. *v.* The Cushion Tire Wheel Co., in the Circuit Court of the United States for the Eastern Div. of the Southern District of Ohio; also a certified copy of a stipula-
1992 tion and decree in the case of The Rubber Tire Wheel Co. *v.* The Batavia Carriage Wheel Co. in the U. S. Circuit Court for the Northern District of New York in Equity No. 6446; also a certified copy of an interlocutory decree in the case of The Rubber Tire Wheel Co. *v.* The Victor Rubber Tire Co. in the United States Circuit Court for the Eastern Division of the Southern District of Ohio, in equity No. 4890, also an interlocutory decree in the case of The Thomson Electric Welding Co. against the American Rubber Tire Co. and C. W Stapleton in the Circuit Court of the United States for

the Southern District of New York, in Equity, and the same are marked "Complainant's Exhibit, Sundry Orders and Decrees" the respective decrees being identified by the marks and titles above indicated. 1993

Defendant objects to the receipt in evidence of the decree in the case of the Thomson Electric Welding Co. *v.* The American Rubber Tire Co. and C. W. Stapleton on the ground that it is not properly authenticated or certified by the clerk as required by the rules and practice of the court, and further that it is wholly immaterial and irrelevant to the issues in the case. Defendant objects to the receipt of the interlocutory decree in evidence as wholly immaterial and irrelevant, especially as it does not appear that it was opposed by the defendants in the action in which it purports to have been rendered and for aught it appears may have been the result of collusion on the part of those interested for complainant in this action. Defendant objects to the receipt of the decrees against Charles S. Lockwood *et al.* No. 854, against the Cushion Tire Wheel Co., (Number not given), against the Batavia Carriage Wheel Co. No. 6446, on the ground that each and all of them were rendered by fraud on the court and through a collusive arrangement made between this complainant or its authorized agents and said defendants or their representatives and that the same were procured in order to effect if possible the rights of the defendant in this action, that all are therefore incompetent, irrelevant and immaterial. 1994 1995

Defendant notifies complainant's counsel that to meet the new issues raised in the rebuttal testimony and to overcome any presumption that might arise from the decrees above mentioned, and as sur-rebuttal to large quantities of the incompetent and irrelevant portions of the complainant's depositions and the evidence taken on its

1996 part, it will apply to the court as soon hereafter as practicable for an order permitting it to take further proofs in answer to the rebuttal and its incompetent and irrelevant portions and to such of it as is new matter, and for such other or further order as it may be advised is proper or necessary.

Complainant's counsel gives notice that he shall set the cause down for hearing and ask to have the same placed on the calendar as soon as the same shall be practicable in due course of business of the court.

1997

State of Ohio, County of Clark, ss:

I, Charles I. Welch, a Notary Public in and for the County of Clark and State of Ohio, hereby certify that the above witnesses, Van H. Cartmell, Bertram G. Work, and Arthur W. Grant, were by me first duly sworn to testify the truth, the whole truth and nothing but the truth; that their depositions were reduced to writing by myself in the presence of said witnesses respectively and when completed subscribed by said witnesses respectively in my presence and in the presence of such of the parties and counsel as attended; that said depositions were taken
1998 pursuant to the annexed notices at the office of Paul A. Staley, 56 Gotwald Building, Springfield, Ohio, beginning on Monday, the 8th day of August, 1898, and continuing from day to day as set forth; that the parties were represented at the taking of said depositions by their respective counsel as set forth; that the several exhibits recited were offered in evidence and marked as specially noted in the foregoing depositions; and that I am not counsel or relative of either party or otherwise interested in the event of this suit.

In testimony whereof I have hereunto set my hand 1999
and official seal, this 15th day of August, 1898.

CHAS. I. WELCH,
[SEAL.] Notary Public,
Clark County, Ohio.

FEES.

Notary, 250 folios at 20c.....$50.00
Paid by Complainant.

United States of America, Southern District of New York, ss:

2000

I, John A. Shields, Clerk of the Circuit Court of the United States in and for the Second Circuit and Southern District of New York,

Do hereby certify that I have compared the preceding with the original Deposition of Arthur W. Grant, in the cause entitled The Rubber Tire Wheel Company *vs.* The Columbia Pneumatic Wagon Wheel Company, on file and of record in my office, and that the same is a true and correct transcript therefrom, and of the whole of said original.

In testimony whereof, I have hereunto set my hand and affixed the Seal of said Court, at the City of New 2001
York, in the District and Circuit above named, this 27th day of December, in the year of our Lord one thousand nine hundred and seven, and of the Independence of the United States the one hunderd and Thirty-second.

JOHN A. SHIELDS,
[SEAL.] Clerk.

At a Stated Term of the Circuit Court of the United States of America for the Southern District of New York, in the Second Circuit, held at the United States Court Rooms in the Borough of Manhattan, in the City of New York, on Friday, the 28th day of February, in the year of our Lord one thousand nine hundred and eight.

Present: The Honorable George C. Holt, Judge.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

This cause coming on for final hearing upon the pleadings and proofs.

Charles W. Stapleton, Esq., and Paul A. Staley appeared for complainants.

Charles K. Offield, Esq., appeared for defendant.

Decided from bench.

Decree for complainant.

An extract from the minutes.

JOHN A. SHIELDS, *Clerk.*

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY ET AL., Complainants,

vs.

DIAMOND RUBBER TIRE COMPANY OF NEW YORK, Defendant.

Charley W. Stapleton, Straley & Bowhan, for Complainants.
Philip B. Adams, Offield, Towle & Linthicum, for Defendant.

HOLT, *J.:*

(Orally, to Mr. Straley:) I think I do not need to hear you further. The general rule is, of course, that a decree is not technically *res adjudicata* unless it is in a suit between the same parties. But in a patent suit if the question of the validity of a patent has been once tried and determined on the merits any court ought to follow that decision as determining the validity or invalidity of the patent unless the new evidence discloses some new defense. The defendant might find a new patent anticipating the patent sued on or something like that, but the question in this case was presented and tried out before Judge Platt and before the Circuit Court of Appeals; evidence was taken and experts examined. One side gave evidence that the wires would hold the tire firm and immovable, and the other side gave evidence that they would not. Now, in this case, you have called more experts giving the same kind of evidence, that the wires would not allow the tires to tip, but in my opinion that evidence is merely cumulative, and could not, in the nature of the case, present any such different result that this court would be justified in not following the opinion of the Circuit Court of Appeals. Of course, if your

defense was that this defendant does not infringe, that would be an entirely different question, but the only question argued here is as to the validity or invalidity of the patent.

That question having been once tried out and a decision made, I do not see what right any other defendant had to go over the same evidence and call upon the court to go over it again, particularly when the decision of the Circuit of Appeals is controlling. In my opinion the only point in this case, that of the validity of the patent, has been decided by the Circuit Court of Appeals. If I am wrong I will be corrected on appeal, but I feel very strongly I am not wrong. The Circuit Court of Appeals is at liberty, if they see fit to review their own decision, to conclude that they were wrong, but I certainly am not.

A decree may be taken by the complainants.

United States Circuit Court, Southern District of New York.

In Equity. No. 186.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Decree.

March 2d, 1908.

This cause having come on to be heard upon the pleadings and proofs herein filed on behalf of both parties, and after hearing Chas W. Stapleton and Paul R. Staley for complainants and Chas. K. Offield, Esq., for defendant, and after due proceedings had, it is, upon consideration,

Ordered, adjudged and decreed as follows:

1. That the Letters Patent of the United States in complainants' bill mentioned, to wit, Letters Patent No. 554,675, dated Feb. 18th, 1896, issued to Arthur W. Grant for improvements in rubber tired wheels and assigned to the complainants, are good and valid in law.

2. That the said Arthur W. Grant was the first true and original inventor of the improvements described and claimed in said Letters Patent.

3. That said complainants are the lawful owners and entitled to the exclusive right and title in and to said Letters Patent and in and to the invention and improvements thereby secured.

4. That said defendant by reason of the manufacture and sale of rubber tired wheels constructed in accordance with said improvements described and claimed in said Letters Patent and in complainants' bill set forth, has infringed the two claims of the said Letters Patent and violated the exclusive rights of the said complainants thereunder.

5. That said complainants do recover of the defendant the gains

and profits made by it and the damages sustained by complainants by reason of such infringement.

6. It is hereby referred to John A. Shields, residing at New York City, as Master, to ascertain the amount of such gains and profits and the damages sustained by the said complainants by reason of such infringement, and that complainants on such accounting have the right to cause an examination of the officers of the Diamond Rubber Company of New York, *ore tenus* or otherwise; and also the production of the books, vouchers and documents of the defendant, and that said defendant attend for such purposes before said Master from time to time as said Master shall direct.

7. That a writ of injunction according to the prayer of said bill be issued out of and under the seal of this court restraining and enjoining the said defendant Diamond Rubber Company of New York, its agents, employees, servants, workmen and all others acting by or under its authority, from any further infringement of said Letters Patent and of the exclusive rights of complainants thereunder.

8. That complainants recover of the defendant its costs and disbursements of this suit to be duly taxed, and that the question of increased damages be reserved until the coming in of the Master's report.

GEO. C. HOLT, *J.*

(Endorsed:) United States Circuit Court, Southern District of New York.—Consolidated Rubber Tire Co., and ano., Complainants, *vs.* Diamond Rubber Company of N. Y., Defendant.—Decree.—Chas. W. Stapleton, Att'y for Complainants, 220 Broadway, New York, N. Y.—Please take notice that a decree of which the within is a copy will be presented to Hon. Geo. C. Holt, for settlement and signature at his Chambers in the Post Office Building, Borough of Manhattan, City of New York, on the 2d day of March, 1908, at 10 o'clock in the forenoon.—Dated Feb'y 29th, 1908.—Chas. W. Stapleton, Att'y for Complainants, 220 Broadway, New York, N. Y.—To Philip B. Adams, Att'y for Defendant.—Received — office of Philip B. Adams, 21 Park Row, N. Y., Feb. 29, 1908.—U. S. Circuit Court, Southern District of New York.—Filed Mar. 2, 1908.—John A. Shields, Clerk.

Circuit Court of the United States, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,

vs.

THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Now comes the defendant and says that in the records and proceedings in the said Court in the above-entitled cause and the interlocutory decree made and entered therein on the 2d day of March, 1908, there is manifest error and for error the said complainants assign the following:

First. That the Court erred in holding that Letters Patent of the

United States number 554,675 herein sued upon were good and valid Letters Patent.

Second. That the Court erred in holding that the defendant, The Diamond Rubber Company of New York, had infringed upon said Letters Patent herein sued upon.

Third. That the Court erred in granting an injunction as prayed for in the bill of complaint.

Fourth. That the Court erred in finding the said complainants are the lawful owners and entitled to the exclusive right and title in and to said Letters Patent and in and to the inventions and improvements thereon secured.

Fifth. That the Court erred in finding that said patentee Grant was the first true and original inventor of the alleged improvements described and claimed in said Letters Patent.

Wherefore, the defendant prays that the said decree and injunctional order be reversed and that the Circuit Court be directed to set aside said decree and injunctional order and to dismiss the bill of complaint herein at complainants' cost.

OFFIELD, TOWLE & LINTHICUM,
PHILIP B. ADAMS,
Solicitors for Defendant.

CHARLES K. OFFIELD,
Of Counsel.

Circuit Court of the United States, Southern District of New York.

In Equity. No. 186.

THE CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
vs.
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

The above-named defendant, Diamond Rubber Company of New York, conceiving itself aggrieved by decree and order entered herein this 2d day of March, 1908, hereby appeals from said decree or order to the United States Circuit Court of Appeals for the Second Circuit, and prays that this appeal may be allowed and that a transcript of the record and proceedings and papers upon which said decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals for the Second Circuit, and that the (3) exhibits, being the printed records in the case of these complainants against the Firestone Tire & Rubber Company, in the United States Circuit Court of Appeals for the Second Circuit, and in the case of these complainants against the Goodyear Tire and Rubber Company in the United States Circuit Court of Appeals for the Sixth Circuit, and in the case of this complainant against the Kokomo Rubber Company in the United States Circuit Court of Appeals for the Seventh Circuit, and marked respectively in this case "Exhibit Appeal Record Firestone Case," and "Exhibit Appeal Record Goodyear Case," and "Exhibit Appeal Record Kokomo Case," may be transmitted and

sent to the United States Circuit Court of Appeals for the Second Circuit as a physical exhibit, together with the transcript of record, etc.

And your petitioner further prays that all proceedings be suspended in the above case during the pendency of said appeal.

And your petitioner further prays that said appeal when allowed shall act as a supersedeas under bond now given to stay the injunction and further proceedings in this Court pending said appeal, under the opinions already given, and entered by the United States Circuit Court of Appeals of this Circuit.

OFFIELD, TOWLE & LINTHICUM,
PHILIP B. ADAMS,
Solicitors for Defendant.

CHARLES K. OFFIELD,
Of Counsel.

Circuit Court of the United States, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
vs.
THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Order.

The complainant having this day presented its petition for appeal to the United States Circuit Court and the said Circuit Court of Appeals for the Second Circuit and prays that the said appeal might be made a supersedeas, and the Court having duly considered the matter,

It is hereby ordered,

First. That the appeal be allowed.

Second. That the said printed records of the respective Courts of Appeal of the Second and Sixth and Seventh Circuits, marked "Exhibit Appeal Record of Goodyear Case," "Appeal Record Firestone Case," be sent to the Circuit Court of Appeals of this Circuit, and the "Appeal Record Kokomo Case," as physical exhibits as prayed for in the petition for appeal.

Third. That a bond be given in the penal sum of ten thousand dollars, which, when given, shall stand and act as a supersedeas until final determination of this action, provided that if the proceedings on appeal are unreasonably delayed an application may be made to vacate the supersedeas.

Fourth. Th-t all proceedings be suspended in the above case in this Court during the pendency of said appeal.

Dated March 2d, 1908.

GEO. C. HOLT,
U. S. Circuit Judge.

(Endorsed:) United States Circuit Court, Southern District of New York.—Consolidated Rubber Tire Company and The Rubber

Tire Wheel Company, Plaintiff, against Diamond Rubber Company of New York, Defendant.—Assignment of Error, Notice of Appeal, Order.—Philip B. Adams, Attorney for Defendant, Office and P. O. Address, 21 Park Row, Borough of Manhattan, New York City.—Due and personal service of Petition, Assignment of Errors and Decree of which the within are copies is hereby admitted this 2d day of March, 1908.—Chas. W. Stapleton, Attorney for Complainants.—U. S. Circuit Court, Southern District of New York.—Filed Mar. 2, 1908.—John A. Shields, Clerk.

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
against
THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Know all Men by these Presents, That the Federal Union Surety Company, a corporation organized and existing under the laws of the State of Indiana, and lawfully transacting business in the State of New York and having an office and usual place of business in said State at No. 35 Nassau street, Borough of Manhattan, City of New York, is held and firmly bound unto the above-named complainants, the Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, in the sum of ten thousand ($10,000.00) dollars, lawful money of the United States, for the payment of which, well and truly to be made, we bind ourselves, our successors and assigns firmly by these presents.

Sealed with our seals and dated this 4th day of March, 1908.

The condition of the above obligation is such that whereas the above-named defendant, The Diamond Rubber Company of New York, has appealed to the United States Circuit Court of Appeals for the Second Judicial Circuit from a decree entered herein in the office of the Clerk of the United States Circuit Court for the Southern District of New York, March 2d, 1908, adjudging, among other things, said defendant to infringe United States Letters Patent No. 554,675 and directing an injunction and accounting.

Now, therefore, the condition of this obligation is such that if the above-named defendant, The Diamond Rubber Company of New York, shall prosecute the said appeal to effect and answer all damages and costs, gains, profits and damages sustained by complainants that may be awarded against it in said suit, or if it shall fail to make its plea good or to sustain its appeal, then this obligation to be void, otherwise to remain in full force and virtue.

FEDERAL UNION SURETY COMPANY,
By ROBERT M. NUGENT,
[SEAL.] *Res. Vice-President.*

Attest:
E. B. HOXIE,
Res. Ass't-Secretary.

(Endorsed:) United States Circuit Court, Southern District of New York.—Consolidated Rubber Tire Company and the Rubber Tire Wheel Company, Complainants, against The Diamond Rubber Company of New York, Defendant.—Supersedeas Bond Federal Union Surety Company.—I approve of the within bond, and of the sufficiency of the surety. Assured as to form and also as to sufficiency of sureties, with reservation, however, to the of the right at any time to examine the proper officers of the Surety Company, under oath, touching its assets, liabilities and financial condition generally.—Geo. C. Holt, U. S. Circuit Judge.—U. S. Circuit Court, Southern District of New York.—Filed Mar. 4, 1908.—John A. Shields, Clerk.

Federal Union Surety Company.

Circuit Court of the United States of America for the Southern District of New York, in the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,

against

THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Bond for Damages and Costs.

Know all Men by these Presents, That the Federal Union Surety Company, a corporation organized under the laws of the State of Indiana and having its principal office in the City of Indianapolis, Indiana, and lawfully transacting business in the State of New York, and having its principal office in said State at No. 1 Madison avenue, in the Borough of Manhattan, in the City of New York, is held and firmly bound unto the above-named complainants in the sum of two hundred and fifty ($250.00) dollars, to be paid to the said complainants, for the payment of which well and truly to be made it binds itself, its successors and assigns, jointly and severally, firmly by these presents. Sealed with its seal, and dated the 4th day of March in the year of our Lord one thousand nine hundred and eight.

Whereas, the above-named The Diamond Rubber Company of New York has prosecuted an appeal to the United States Circuit Court of Appeals for the Second Circuit, to reverse the order rendered in the above-entitled suit, by the Judge of the Circuit Court of the United States for the Southern District of New York.

Now, therefore, the condition of this obligation is such that if the above-named The Diamond Rubber Company of New York shall prosecute its appeal to effect, and answer all damages and costs if it fail to make its plea good, then this obligation shall be void, otherwise the same shall be and remain in full force and virtue.

FEDERAL UNION SURETY COMPANY,
By ROBERT M. NUGENT,
Resident Vice-President.

[SEAL.]

Attest:

E. B. HOXIE,
Resident Assistant Secretary.

Sealed and delivered, and taken and acknowledged this 4th day of March, 1908, before me,

ESTHER BERG,
Notary Public, New York County.

Cert. filed in Kings, Queens, Richmond and Westchester Counties.

STATE OF NEW YORK,
County of New York, ss:

On this 4th day of March, 1908, before me personally appeared Robert M. Nugent, Resident Vice-President of the Federal Union Surety Company, with whom I am personally acquainted, who, being by me duly sworn, said that he resides in ; that he is the Resident Vice-President of the Federal Union Surety Company, the corporation described in and which executed the foregoing bond; that he knows the corporate seal of said company; that the seal affixed to the foregoing instrument is such corporate seal; that it was affixed by order of the Board of Directors of the said company, and that he signed said instrument as Resident Vice-President of said company by like authority; and that the liabilities of said company do not exceed its assets, as ascertained in the manner provided by law and confirmed by an order of the Supreme Court of New York, made and entered in New York County on March 30, 1904. And the said Robert M. Nugent further said that he is acquainted with E. B. Hoxie and knows him to be the Resident Assistant Secretary of said company; that the signature of said E. B. Hoxie subscribed to the said instrument is in the genuine handwriting of the said E. B. Hoxie and was thereto subscribed by the like order of the said Board of Directors, and in the presence of him, the said Robert M. Nugent, Resident Vice-President.

ESTHER BERG,
Notary Public, New York County.

Cert. filed in Kings, Queens, Suffolk, Richmond and Westchester Counties.

Copy of By-Law.

Be it remembered, That at a meeting of the Board of Directors of the Federal Union Surety Company, duly called and held on the tenth day of July, 1901, a quorum being present, the following By-Law was adopted:

"ARTICLE VIII, SEC. 1. The President, Vice-President, or Second "Vice-President may, from time to time, appoint Resident Vice-"Presidents, Resident Assistant Secretaries and Attorneys in fact, "to represent and act for, and on behalf of the Company; and either "the President, Vice-President, Second Vice-President, the Board "of Directors or the Executive Committee may, at any time, re-"move any such Resident Vice-President, Resident Assistant Secre-"tary, or Attorney in Fact, and revoke the power and authority "given him.

"SEC. 3. *Resident Vice-Presidents.*—Resident Vice-Presidents "shall have power and authority to sign and execute on behalf of "the Company, any and all bonds, recognization, contracts of in- "demnity and other writings obligatory in the nature thereof, and "to bind the Company thereby as fully and to the same extent as "the President could bind it."

"SEC. 4. Resident Assistant Secretaries shall have power and "authority to affix the seal of the Company to, and attest on behalf "of the Company, any and all bonds, recognizances, contracts of in- "demnity and other writings obligatory in the nature thereof as "fully and to the same extent as the Secretary could bind it."

STATE OF NEW YORK,
County of New York, ss:

I, E. B. Hoxie, Resident Assistant Secretary of the Federal Union Surety Company, have compared the foregoing By-Law with the original thereof, as recorded in the Minute Book of said Company, and do certify that the same is a correct and true transcript therefrom, and of the whole of said original By-Law.

Given under my hand and seal of the Company this 4th day of March, 1908.

E. B. HOXIE,
Resident Assistant Secretary.

(Endorsed:) United States Circuit Court, Southern District of New York.—Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, Complainants, against The Diamond Rubber Company of New York, Defendants.—Bond for Damages and Costs.—Surety: Federal Union Surety Company.—Approved as to form and as to sufficiency of sureties, with reservation, however, to the of the right at any time to examine the proper officers of the Surety Company, under oath, touching its assets, liabilities and financial condition generally.—Geo. C. Holt, U. S. Circuit Judge.—U. S. Circuit Court, Southern District of N. Y.—Filed Mar. 4, 1908.—John A. Shields, Clerk.

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER WHEEL TIRE COMPANY, Complainants,
vs.
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Clerk of the Court:

The defendant herein having appealed to the United States Circuit Court of Appeals for the Second Circuit from the decree entered herein March 2d, 1908, the complainants hereby waive the issuing and service upon them of the citation prescribed by the rules and

practice of this Court, and hereby appear herein on said appeal waiving service of all notice or citation whatsoever.

Dated March 4th, 1908.

CHAS. W. STAPLETON,
Solicitor for Complainants, Consolidated Rubber Tire Company and The Rubber Tire Wheel Company.

(Endorsed:) United States Circuit Court, Southern District of New York.—Consolidated Rubber Tire Co. and ano., Complainants, *vs.* Diamond Rubber Company of N. Y., Defendant.—Waiver of Citation.—Chas. W. Stapleton, Att'y for Complainants, 220 Broadway, New York, N. Y.—U. S. Circuit Court, Southern District of N. Y.—Filed Mar. 4, 1908.—John A. Shields, Clerk.

By the Honorable George C. Holt, one of the Judges of the Circuit Court of the United States for the Southern District of New York, in the Second Circuit, to Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, Greeting:

You are hereby cited and admonished to be and appear before a United States Circuit Court of Appeals for the Second Circuit, to be holden at the Borough of Manhattan in the City of New York, in the District and Circuit above named, on the 27th day of March, 1908, pursuant to a petition of appeal filed in the Clerk's office of the Circuit Court of the United States for the Southern District of New York, wherein Diamond Rubber Company of New York is defendant and you are complainants, to show cause, if any there be, why the decree in said action mention- should not be corrected and speedy justice should not be done in that behalf.

Given under my hand at the Borough of Manhattan, in the City of New York, in the District and Circuit above named, this 9th day of March, in the year of our Lord one thousand nine hundred and eight, and of the Independence of the United States the one hundred and thirty-two years.

GEO. C. HOLT,
Judge of the Circuit Court of the United States for the Southern District of New York, in the Second Circuit.

(Endorsed:) United States Circuit Court of Appeals, for the Second Circuit.—Consolidated Rubber Tire Company and Rubber Tire Company, Plaintiff, against The Diamond Rubber Company of New York, Defendant.—Citation.—Service of the within citation is admitted M'ch 10th, 1908.—Chas. W. Stapleton, Solicitor for Complainants, 220 Broadway, N. Y.—U. S. Circuit Court, Southern District of N. Y.—Filed Mar. 10, 1907.—John A. Shields, Clerk.

UNITED STATES OF AMERICA,
Southern District of New York, ss:

I, John A. Shields, Clerk of the Circuit Court of the United States of America for the Southern District of New York, in the Second

Circuit, do hereby certify that the foregoing pages numbered from 1 to 744, inclusive, contain a true and complete transcript of the record and proceedings had in said Court, in the cause entitled Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, complainants, against The Diamond Rubber Company of New York, defendant, as the same remain of record and on file in my office.

In Testimony Whereof, I have caused the seal of the said Court to be hereunto affixed, at the City of New York, in the Southern District of New York, in the Second Circuit, this 10th day of March, in the year of our Lord one thousand nine hundred and eight, and of the Independence of the said United States the one hundred and thirty-second.

[SEAL.] JOHN A. SHIELDS, *Clerk.*

United States Circuit Court of Appeals for the Second Circuit.

No. 261, October Term, 1907.

Argued May 6, 1908; Decided June 3, 1908.

THE CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,

vs.

THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Appeal from the Circuit Court of the United States for the Southern District of New York.

Before Judges Lacombe, Coxe and Noyes.

On appeal from a final decree of the Circuit Court for the Southern District of New York entered March 2, 1908, sustaining the two claims of Letters Patent No. 554,675 to Arthur W. Grant for improvements in rubber tired wheels and ordering an injunction and an accounting. The patent was sustained by this court in an action by complainant against The Firestone Tire and Rubber Company, the decision being filed Jan. 30, 1907. 151 *Fed.* 237. The opinion of this court upon appeal from the order granting a preliminary injunction in the present action is reported in 157 *Fed.* 677.

Charles K. Offield, C. C. Linthicum and *Philip B. Adams,* for the Appellant.

Paul A. Staley, Border Bowman, Thomas W. Bakewell and *Charles W. Stapleton,* for the Appellees.

COXE, *Circuit Judge:*

This appeal is in the nature of a reargument of the questions decided in the Firestone Case. It is not here upon newly discovered evidence for the additional testimony was as available in that case

as in this. There is more testimony it is true but it is cumulative merely. The counsel are the same, the issues are the same. The judge of the Circuit Court correctly states the situation as follows:

"The question in this case was presented and tried out before Judge Platt and before the Circuit Court of Appeals; evidence was taken and experts examined. One side gave evidence that the wires would hold the tire firm and immovable, and the other side gave evidence that they would not. Now, in this case, you have called more experts giving the same kind of evidence, that the wires would not allow the tires to tip, but in my opinion that evidence is merely cumulative, and could not, in the nature of the case, present any such different result that this court would be justified in not following the opinion of the Circuit Court of Appeals. Of course, if your defense was that this defendant does not infringe, that would be an entirely different question, but the only question argued here is as to the validity or invalidity of the patent.

"That question having been once tried out and a decision made, I do not see what right any other defendant had to go over the same evidence and call upon the court to go over it again, particularly when the decision of the Circuit Court of Appeals is controlling. In my opinion the only point in this case, that of the validity of the patent, has been decided by the Circuit Court of Appeals."

We think the judge was justified in so holding. If courts are to examine defenses in patent cases *de novo*, as often as they are presented, litigation will continue until the resources of the defendants or the patience of the complainant, and possibly the patience of the court, are exhausted. The question of the capacity of the tires to rise slightly and re-adjust themselves when subjected to severe lateral strain, was one of the principal questions litigated in the Firestone Case and, as we pointed out in our opinion, the tendency to do this was admitted by the defendant's expert. He says: "There is no doubt that when lateral pressure is applied to one side of the exposed portion of the tire, there is a tendency to roll the tire out of the channel."

The tests made in that case convinced us that this tendency actually existed and that we were safe in assuming as established, a proposition about which the experts on both sides agreed and the truth of which was demonstrated in open court.

The impossibility of proving or disproving in any satisfactory manner the existence of this tipping tendency by the observation of the vehicle in actual use or the examination of a worn out tire, will be admitted after a moment's reflection. The human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction at an angle of 45 degrees. So too a worn out tire with cuts and abrasions along its entire periphery may have the tipping capacity in question. The fact that tires have been produced in court which were rusted in the steel channel, is not important unless it be proved that they were subjected to severe lateral strain.

A tire used on asphalt pavements or on smooth park roads would probably remain in place if but one wire were used. We do not lose

sight of the fact that the testimony shows that many of the tires from Chicago received rough usage but this testimony avails little in face of the experiment which showed us the bottom of the tire rolled up by lateral strain and re-seated the moment the strain was removed. This record presents nothing new which would warrant us in changing our former decision.

Another volume of 500 pages has been added to the library which has accumulated during the last ten years through the efforts of many defendants who seem determined to use what they, in effect, assert to be a useless device. The indomitable persistency with which these people have fought for the right to use the Grant tire is more persuasive evidence of its merits than the opinions of experts.

If the Willoughby, Latta and other tires are as good as Grant's why do not these defendants use them? The almost frantic efforts which have been made to use the Grant tires are inconsistent with the argument that they show no inventive genius and we are more and more convinced that we were right when we said that "no successful rubber tire can be made without embodying the distinguishing features of the Grant patent."

The decree is in the usual form, it restrains the defendant from any further infringement of the Grant patent and orders a reference to compute the profits and damages by reason of such infringement. Tires which do not infringe, the defendant is at liberty to sell. The presumption is that the complainants will not seek to prevent the defendant from doing a legal act and will not attempt to make it account for tires which it has a right to sell. Should such an attempt be made, it can be disposed of by the court upon facts then presented. Such questions frequently arise when the complainant attempts to compel an accounting for devices not passed upon by the court at final hearing.

When this cause was before the court upon an appeal from the order granting a preliminary injunction we recognized as proper the following clause in the order.

"Nothing in this injunctional order shall prevent, or is intended to prevent or enjoin the defendant from handling, using or selling rubber tires and rims covered by the Grant patent, * * * manufactured by the Goodyear Tire and Rubber Company having a right to manufacture, use and sell such tires under a judicial decree in a litigation in the Federal Courts in the District of Indiana heretofore pending between this complainant and such parties, wherein it has been judicially determined that said Grant patent is invalid and void."

We see no reason why this language should not be inserted in the decree and direct that it be amended accordingly. The amendment fully recognizes the applicability of the doctrine of *Eldred v. Kessler,* (206 *U. S.* 285), to the case at bar. Whether it should be given a broader interpretation is a question upon which we express no opinion, deeming it more prudent to wait until the facts are fully developed.

There is no occasion for attempting at this time to anticipate the future and to provide for a contingency which may not arise.

Having said what the defendant may not do, it is unnecessary and unwise to attempt, further than as above stated, the difficult task of telling what it may do.

The decision in *Eldred v. Kessler* must, of course, be respected by the complainants and followed by the master. If doubt should arise whether it applies to a given state of facts the court can determine the right of the parties on learning what the facts are. It is safer to base decisons upon facts rather than upon conjecture. To provide in a decree that the defendant is not enjoined from making, using and selling devices which do not infringe or which have been licensed, seems unnecessary. The doctrine of Eldred and Kessler, if carried to the extent contended for by the defendant will introduce radical and far reaching limitations upon the rights of patentees. These questions may not arise in the case at bar but if they should, the court should have the facts, and all the facts, before attempting to decide them.

The decree is affirmed with costs.

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Petition for Rehearing, etc., by Defendant-Appellant.

Charles K. Offield, Charles C. Linthicum, Philip B. Adams, Solicitors and of Counsel for Defendant-Appellant.

[Stamped:] United States Circuit Court of Appeals, Second Circuit. Filed Jun- 11, 1908. William Parkin, Clerk.

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Petition for Rehearing by Defendant-appellant, and, in Case of Overruling thereof, for Stay of the Return of the Mandate for Reasonable Time for Filing Petition for Writ of Certiorari to the Supreme Court of the United States to Remove this Case thereto, etc.

To the Honorable the Judges of the United States Circuit Court of Appeals for the Second Circuit:

The defendant-appellant, the Diamond Rubber Company of New York, in the above entitled cause, respectfully petitions for a rehearing in said cause, and presents to the court the following reasons

why such rehearing should be granted, and why, if overruled, this Honorable Court should order the stay of the mandate in this case for reasonable opportunity given to the defendant-appellant to apply to the Supreme Court of the United States for writ of certiorari to remove this case thereto.

The chances of a grant of a petition for rehearing in patent causes, in the various Circuit Court- of Appeals, we well understand to be in the nature of a forlorn hope, but at the same time we cannot overlook the fact that a clear right to such petition exists to every defeated litigant, and a clear duty to grant such petition if well founded. Your petitioner also believes that in any suit in the Federal Court of Appeals, where it is contemplated to petition the Supreme Court of the United States for writ of certiorari, that if any new matter is to be presented or argued in the Supreme Court, not insisted upon or urged in the court below, or if the matter presented in a writ of certiorari to the United States Supreme Court is different as to the manner of statement and presentation, that the Supreme Court of the United States might well deny such certiorari petition if it did not appear that these matters had been directly called to the attention of the Court of Appeals by a petition for rehearing, before being urged and presented to the Supreme Court.

It is for this reason, largely, supplemented by the opinion of this court given upon the injunction motion herein, that this petition for rehearing is presented, coupled and combined with the petition that the mandate may be stayed until questions presented by the record in this case can be sent and transferred to the Supreme Court of the United States under a petition for writ of certiorari to be applied for, and expected of grant.

1. Your petitioner respectfully submits that it is scarcely fair, or equitable, to determine the rights of this defendant-appellant in this case by what happened to the defendant in the "Firestone case."

This defendant-appellant had nothing to do with the "Firestone case," either directly or indirectly, nor has it ever been so contended, but otherwise,—and this defendant-appellant, supposing that it had a right to defend this suit by such defenses as it deemed proper, upon the record, independent and without embarrassment as to the "Firestone case," at least so far as the testimony of an expert witness is concerned.

It appears from the opinion of this Honorable Court, as your petitioner reads it, that your petitioner's rights have been to a certain extent passed upon, and this case has been decided largely against your petitioner, by reason of the testimony of an expert witness upon behalf of defendant, in the "Firestone case," where such defendant's expert admitted the existence or presence of a fact in this record denied, viz.: As to the "Firestone case" your Honors here state that

"The question of the capacity of the tires to rise slightly and readjust themselves when subjected to severe lateral strain was one of the principal questions litigated in the Firestone case, and, as we pointed out in our opinion, the tendency to do this was admitted by the defendant's expert. * * * The tests made in that case

convinced us that this tendency actually existed and that we were safe in assuming as established, a proposition about which the experts on both sides agreed and the truth of which was demonstrated in open court."

In this case the mechanical expert on the part of the defendant-appellant, denied that any such capacity existed or can exist in any practical use of the tire of the Grant patent when wired on, as the testimony in this record shows, to the utmost capacity or straining tension of the two high carbon steel clamping wires.

We think that the decisions show that the federal judges have been loath to hold, that counsel for either a defendant or a complainant in a patent cause, is responsible for what a mechanical expert has testified to, as to any question of theory or opinion in any such case, to the extent of being controlled thereby, and we know of no heretofore reported case where a defendant in a patent case, making the fight independently in his own behalf, and admittedly without any connection with any other litigation upon the patent asserted—has been held responsible, or has been bound in any way, or has been prejudiced by the testimony of a mechanical expert in a case in which he had nothing to do, and whose testimony he denied, either as to statement or conclusion—by reason of the fact that the counsel in his case happened to be the counsel in the decided case. In this case your Honors say:

"The impossibility of proving or disproving in any satisfactory manner the existence of this tipping tendency by the observation of the vehicle in actual use, or the examination of a worn out tire will be admitted after a moment's reflection. The human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction at an angle of 45 degrees."

It may be that a party would have to look closely to see a tire lift and tilt and tip in its channel in actual use, if such lifting and tipping were so slight as to be scarcely distinguishable to the eye, but any such lifting or tipping of the Grant tire, and rising and falling in the channel, in actual use, as contended for by the complainants, must of necessity be visible to the human eye by any person watching for any such result, and the testimony of complainants' only witness upon this subject is that he has seen it do so (Com. Rec., p. 85); the irresistible conclusion being that if he did witness any such exhibition the tire must have been loose; but the proposition in your Honors' opinion is that the

"human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction at an angle of 45 degrees."

It is difficult to understand how the rapidity of a tire being driven against a trolley rail would interfere with a plain exhibition of the tire rising out from the channel when it struck the rail, if any such condition existed. The lateral thrust upon a tire in motion, to be effective, as to any side displacement of the tire, is most effective if, by any possibility, the whole vehicle body should slew and strike a trolley rail with great force,—for example, by the direct force of

a powerful blow at right angles to the tire. This would mean that the blow is instantaneous upon the revolving tire, the resiliency of the rubber taking up and dispersing the blow without affording, effectively, any opportunity for lifting and reseating of the wires of the tire. This can be easily demonstrated by any carriage wheel in actual operation.

We respectfully submit there would only be a slight tendency of lateral displacement of the tire striking the trolley rail at such an angle. It seems to your petitioner that after a moment's reflection the examination of a worn-out or destroyed tire is the surest test that can be made to determine whether the tipping capacity has been present in the tire in actual use, independent of its proved cemented condition by rust when removed. Perhaps, as your Honors say, "a worn-out tire with cuts and abrasions along its entire periphery" would not determine the tipping capacity in question, if such cuts and abrasions were only along *"its entire periphery,"* but in this case, as the record proves that the tires are worn out, or rather destroyed before they are worn out, by the tons and car loads, and with rare exception otherwise, than by the cutting and abrasion of the tire, *not on its periphery,* but manifestly and indisputably on its interior construction surrounding the wires—we say, a moment's reflection will show that there has been no tipping capacity and yielding and rising and falling in these tires, because they would not have been cut and destroyed by, plainly, the immovability of the wires and the movability of the rubber, if any such tipping capacity existed. There can be no better proof of this test of the alleged tipping capacity in question, in the tires, than by this examination of the tires, and under the light and instruction furnished by your Honors' opinion in the Firestone case, viz., where your Honors stated (Rec., p. 30-31), of this case, where such opinion is printed, as follows:

"The Grant tire has the capacity which no other tire possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber or injury to any of its parts."

Of course when you examine these thousands of Grant tires and find that their almost universal condition is that the rubber is torn and abraded over the wires outwardly from the wires to the periphery, and that all of the parts of the tire have been destroyed by this action,—the conclusion is inevitable that it is a mistaken assumption that any such tipping capacity exists in the Grant tire.

This tipping capacity relates to a question of fact, conditions and not theories, as does also the undisputed fact in this record that the tire is naturally cemented in use to the rim by rust and corrosion, at its canvas base, and that in one example of 10,000 tires, as proven by this record, such cementing and corrosion existed in 9000 of such tires,—and this testified to by a practical witness, and not contradicted, who knows this fact because he took off these 10,000 tires. This fact is proven also not only by a large number of practical witnesses, but by a deposition in this case of a witness, not a theoretical expert, or one who can be accused of juggling with the fact, but by a large handler and dealer of these tires in the way of applying and

removing them as a business industry, and his belief backed up by the artificially cemented tire to a wheel and then run and jammed about the streets of Chicago for a week under every test of lateral strain to which any tire is practically subjected, without any movement or displacement of the tire from its base (Rec., p. 450). The fact of the immovability of these tires at their base, when clamped into position by the high carbon steel tension retaining wires in any exigencies of travel, is also testified to by a large number of witnesses who had the opportunity to know this fact, and all of these witnesses and all of these questions of fact are new in this case, as here presented, and we respectfully submit are not in any way or means expert testimony, but are facts representing, apparently, conditions and not theories, and while this case is not here upon any theory of newly discovered evidence, it is here upon the fact which might or might not have been available in the Firestone case, solely depending upon the party sued, and it is here upon evidence that was not in the Firestone case, and which has never been in any case; and which goes directly to *the existence of the fact,* in distinction from theory or expert testimony.

2. The futility of the test made in open court to determine any right conclusion in this case.

Your Honors speak of this test as follows:

"A tire used on asphalt pavements or on smooth park roads would probably remain in place if but one wire were used."

We would add to this statement the additional fact that the tire would probably remain in place, excepting creeping, if no wire was used, under these conditions. Your Honors further say:

"We do not lose sight of the fact that the testimony shows that many of the tires from Chicago received rough usage, but this testimony avails little in the face of the experiment, which showed us the bottom of the tire rolled up by lateral strain and reseated the moment the strain was removed."

Your petitioner did not look upon this so-called test in the court room as a matter that was to be taken seriously to determine any question at issue in this case. The test consisted in taking one of defendant's exhibited rubber tired wheels, and placing all of the exposed portion of the tire in a vise and then putting a clamping force upon such tire of certainly several tons pressure and then forcing the wheel itself out of line to an angle of about 45 degrees. It was true that the bottom of the tire cleared the channel by this performance and the supposition was at once arrived at that the wires had been lifted and pulled or displaced from their normal position.

We respectfully submit that it was not certain that the wires had been moved otherwise than sidewise or that the exposed portion of the bottom of the channel was not produced by the several tons clamping pressure, but on the rubber tire itself, which stretched or pulled it to a thin condition under the wires, as can easily be illustrated by a thick rubber band being placed over a round lead pencil and then pulled to an exceedingly thin condition around the pencil.

However this may be, it is absolutely certain that no wheel in

travel is ever subjected to any such test as was applied to the wheel in the court room, nor ever can be, and we submit that a test applied to a wheel and tire that never can occur in natural use is no test at all.

However this may be, the second test that was applied to the wheel in the court room, that might possibly be of some value, showed conclusively that the wires did not move or lift or rise or fall when the rubber tire was subjected to a lateral strain that could be received in travel, and lateral strain is the only force that can be put upon the tire that complainants assert will cause it to rise and fall in actual use. The second test we refer to as taking place in the court room, was after the close of the first test, when complainants' employees and your petitioners at the investigation of defendant, and by the direction of complainant's counsel, placed the rubber portion of the tire upon the wheel loosely in the vise, the wheel being in an upright position, and then with the weight of a man pressing upon the vertical wheel, attempted to turn the wheel out of the vise, and make it ride up and out on the jaws of the vise by a torsion or twisting movement. In this instance it is our distinct recollection that it was plain that the rubber itself only moved or flowed, or yielded, and the wires themselves remained in position, clamping the base of the tire to the channel.

We are not certain whether all of your Honors remained to witness this so-called test, and we respectfully urge that any such unnatural and impossible conditions in actual use of the tire in its first test should not militate for a moment against the proven facts in this case.

3. The decree of the court below should be amended accurately and comprehensively, as shown by this record, in view of Eldred *v.* Kessler.

Your Honors have ordered that a certain clause appearing in the order granting a preliminary injunction was proper and should be incorporated in the decree in this case, and such decree amended accordingly. The clause quoted by your Honors as appearing in the order of the court below is as follows:

"Nothing in this injunction order shall prevent, or is intended to prevent or enjoin the defendant from handling, using or selling rubber tires and rims covered by the Grant patent,—manufactured by the Goodyear Tire & Rubber Company having a right to manufacture, use and sell such tires under a judicial decree in a litigation in the Federal Courts in the District of Indiana, heretofore pending between this complainant and such parties wherein it has been judicially determined that the said Grant patent is invalid and void."

A close reading of this order shows that the facts of antecedent litigations and the heretofore judicial declaration of the invalidity of the Grant patent are not correctly stated, and this fact arose out of Judge Holt's personally changing the form of the order of decree as presented by the defendant-appellant, so as to particularize the individual cases in which the Grant patent, both as to courts and defendants, had been found invalid. The case of the Goodyear Tire & Rubber Company was in the Sixth Circuit, and of course not in

the District of Indiana, in the Seventh Circuit. What Judge Holt intended to do, and which he omitted, was after the words "Federal Courts"—which he took to mean both the courts of the Circuit, and the Supreme Court of the United States as to the Goodyear case—what he intended to interline there, and evidently omitted was, "and against the Kokomo Rubber Company in the District of Indiana." With these insertions the clause quoted in your Honors' opinion would be made clear, and represent the actual intention of the court.

In the present case there was introduced a record in another case not present on the injunction motion, where the patent had been declared invalid, viz., these complainants against the Victor Rubber Tire Company, in the Sixth Circuit. That case went to the Court of Appeals of the Sixth Circuit, 123 F. R., 85, the record of which is present here as an exhibit.

In view of these facts, and this record, we respectfully petition that your Honors will direct that the decree in this case will be amended as follows:

"Nothing in this injunction shall prevent or is intended to prevent, or enjoin this defendant from handling, using and selling rubber tires and rims covered by the Grant patent * * * manufactured by the Goodyear Tire & Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the Federal Courts of the Sixth Circuit; or manufactured by the Kokomo Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the District of Indiana, Seventh Circuit; or manufactured by the Victor Rubber Tire Company, under a judicial decree in a litigation in the Federal Courts in the Sixth Circuit, wherein in such litigations it has been judicially determined that the said Grant patent is invalid and void."

If your Honors will so direct the amendment of the decree of the court below accordingly, the facts in this case, as contemplated by the amendment, will be fully and rightfully identified and set forth.

4. The decree should be so amended as to show that nothing in the injunctional order shall prevent, or is intended to prevent or enjoin the defendant from handling, using or selling rubber tires and rims covered by the Grant patent and manufactured by any party, person or corporation in the Sixth Circuit, where the Grant patent has been judicially determined invalid and void, and sold in that circuit.

Your petitioner would respectfully urge that it should be ordered by your Honors that, there now should be incorporated in the decree below an amendment as above defined. The Grant patent is invalid and void in the Sixth Circuit, and the Supreme Court of the United States has refused to disturb a decree so finding.

It would at first glance appear unseemly for the courts of any other Circuit to enjoin the use, handling or sale of a device claimed to be covered by a patent and manufactured and sold in a Circuit where the patent was invalid and void. The patent being invalid and void in that Circuit, the manufacturing of the device in that Circuit is a matter of right, and, being rightfully manufactured and sold in that Circuit, they cannot be held to be unlawfully manufactured

or sold in another Federal Circuit, and for this reason your petitioner petitions that this decree below be further amended accordingly. To so hold and order, upon your Honors' part, would be nothing more than a recognition of the principle that a device once manufactured and sold under a license and right in a particular territory, under valid letters patent, could be taken and used territorily in any part of the United States, no matter how hostile thereto, in the hands of other parties holding the patent in such territory.

5. Your petitioner's request that the mandate in this case should be stayed, with reasonable opportunity for your petitioner to file its petition for writ of certiorari in the Supreme Court of the United States, should certainly be granted.

There is upon this record the curious and unfortunate condition that this Grant patent has been judicially declared a good and valid patent in this Circuit and has been declared invalid and void throughout the entire Sixth Circuit, and in the Seventh Circuit. Whatever difference of opinion there may be as to the identity of the facts in the litigations carried on under this patent in these Circuits, there is no dispute at all that there is a direct difference in result, and a direct conflict of opinion between these several Circuits, and the judges of these Circuits, respectively, both at the Circuit and constituting the respective courts of appeals.

It is precisely under these conditions that the Supreme Court of the United States has recognized that the writ of certiorari, upon petition, should be granted, and has so granted the same.

Mast-Foos Co. v. Stover Mfg. Co., 177 U. S., 485.
Columbus Watch Co. v. Robins, 148 U. S., 267.

There is an additional reason, we submit, why the writ should be granted in this case—because of the manner of the use, of the sustainment of the Grant patent in this Circuit, by this Court of Appeals—which it has and will be put to by these complainants. There is no doubt that the complainants in this case have been using the decision of this Circuit Court of Appeals to force every manufacturer of tires in the United States to recognize and pay tribute under this Grant patent, or, as an alternative, that suits will be brought, and that injunctions will be granted in this Circuit to stop such use or sale in every district of the Second Circuit.

As we pointed out upon the argument, this means that, in the line of states constituting the Second Circuit, extending from Canada to the Atlantic Ocean, no tire like the tire of the Grant patent can be manufactured, used or sold, and every manufacturer or dealer of rubber tires lying east and west of this Circuit will be either driven out of the Circuit, or forced to accede to the demands of the complainants. In many instances these conditions will extinguish the business of a number of dealers in these tires in this Circuit, and will harass and greatly cripple, if not destroy, the long-established business of parties in this Circuit.

It is for this reason that we respectfully urged to the court at the hearing of this case, and also upon the injunction motion, that this court itself should direct that this petition for writ of certiorari

should be filed by this defendant, and the case be taken to the Supreme Court of the United States to settle forever the validity or invalidity of this Grant patent, and we here so formally petition.

Yours Honors in your filed opinion upon the injunction motion in this case, in speaking of the *Eldred v. Kessler* case, stated as follows:

"The opinion opens up a new subject in patent law practice and it is desirable, no doubt, that an early expression of opinion by the Supreme Court should be secured upon a record which will present its broader aspects, but we do not think it wise to certify the questions to that tribunal upon this record."

In this case, upon final hearing, your Honors have declined to certify this question arising out of the *Eldred v. Kessler* case to the Supreme Court, and point out your reasons therefor.

Your Honors further state also in your opinion on the injunction motion as follows:

"Besides that question (*Eldred v. Kessler*) there is the further one whether upon the merits of the whole case the Second Circuit was right in holding the patent to be valid and infringed by a manufacturer other than the Goodyear Tire & Rubber Company. Should the Supreme Court reach the conclusion that this court erred in that respect, the further application of the *Eldred v. Kessler* rule would no longer cut any figure in the case, and by certifying it now we would have unnecessarily vexed that tribunal with a moot question. It would seem that the rights of all can be best preserved by affirming the order, at the same time directing the circuit court (upon the filing of a new bond or the extension of the old one) to suspend the operation of the injunction until final disposition of the cause. The record at final hearing will be so comprehensive as to present every question and when it reaches this court upon appeal, a review of them can be secured from the Supreme Court either by certification or certiorari."

Your petitioner respectfully argues that the record presented at final hearing meets and fulfills the expectations of your Honors, and that such record is so comprehensive as to present every question, and the case is now in a condition rightfully to present to the Supreme Court of the United States your petitioner's petition for writ of certiorari, and the removal of this case thereto, and we again submit that it is within the power of this court, and seemingly, from the decision upon the injunction motion, within the disposition of this court to even direct that this petition be filed upon the part of defendant-appellant: that no further settlements be made between the parties litigant in this court that would prevent the filing of this petition, and for these reasons the mandate should be stayed, and the petition directed to be filed.

We think there is a stronger equity in this request arising out of the fact that this court will remember, upon the hearing of the injunction motion in this court, that your petitioner desired and agreed to go to trial for final hearing before your Honors upon the record as it then stood, there being stipulated into the case, as a part of the record, upon the injunction motion, the records in the "Goodyear

case," the "Kokomo case" and the "Firestone case," and that it was then stated by your petitioner's counsel that they desired to go directly, by a certiorari petition, to the Supreme Court of the United States, to have this whole question settled. The opinion of your Honors, however, in that case satisfied your petition and its counsel,—that the orderly way to present those questions were not from a record made up of *ex parte* affidavits, and upon injunction motion, but upon comprehensive record at final hearing, which is now present.

Your petitioner further prays that if this petition for rehearing be denied, your Honors shall not only stay this mandate, for reasonable time for your petitioner to file its petition for writ of certiorari in the Supreme Court of the United States, but that your Honors will, as a part of this order, direct that the printed records in the "Goodyear case," the "Kokomo case," and the "Firestone case," be sent to the Supreme Court of the United States as physical exhibits, thus saving a vast needless expense that will be put upon your petitioner if these three several records were required to be reprinted to accompany such petition.

Respectfully submitted.

DIAMOND RUBBER COMPANY
OF NEW YORK,
By HARVEY J. WOODWARD,
Secretary.

I hereby certify that I have examined and read the foregoing petition for rehearing, and that in my opinion such petition is well founded, and should be granted by this court, and that such petition is not filed for delay.

CHARLES K. OFFIELD,
Counsel for Defendant-Appellant.

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,
vs.
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

On Petition for Rehearing by Defendant-Appellant.

Per Curiam:

The petition for a re-hearing is denied.

The decree should be amended as requested in the petition by substituting for the clause quoted in our opinion the following:

"Nothing in this injunction shall prevent or is intended to prevent, or enjoin this defendant from handling, using and selling rubber tires and rims covered by the Grant patent, manufactured by the Goodyear Tire & Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the Federal

Courts of the Sixth Circuit; or manufactured by the Kokomo Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the District of Indiana, Seventh Circuit; or manufactured by the Victor Rubber Tire Company, under a judicial decree in a litigation in the Federal Courts in the Sixth Circuit, wherein in such litigations it has been judicially determined that the said Grant patent is invalid and void."

The mandate is stayed until August 1st, 1908, with leave to apply to any member of the court for an extension of the stay on proof that a petition for a writ of certiorari has been duly filed.

The request that we direct that the printed records in the Goodyear, Kokomo and Firestone cases be sent to the Supreme Court as physical exhibits is denied. Although we see no objection to this course being taken we do not feel at liberty to direct it, as it is for the Supreme Court to determine whether changes in the record shall be made. The application should therefore be made to that court or a justice thereof.

Endorsed: United States Circuit Court of Appeals for the Second Circuit. Consolidated Rubber Tire Company and Rubber Tire Wheel Company, Complainants-Appellees, *vs.* Diamond Rubber Company of New York, Defendant-Appellant. Opinion. *Per Curiam.* United States Circuit Court of Appeals, Second Circuit. Filed Jun- 17, 1908. William Parkin, Clerk.

At a Stated Term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the Court Rooms in the Post Office Building in the City of New York, on the 17th day of June one thousand nine hundred and eight.

Present: Hon. E. Henry Lacombe, Hon. Alfred C. Coxe, Hon. Walter C. Noyes, Circuit Judges.

Consolidated Rubber Tire Company and Rubber Tire Wheel Company, Complainants-Appellees,

vs.

Diamond Rubber Company of New York, Defendant-Appellant.

Appeal from the Circuit Court of the United States for the Southern District of New York.

This cause came on to be heard on the transcript of record from the Circuit Court of the United States, for the Southern District of New York, and was argued by counsel.

On consideration whereof, it is now hereby ordered, adjudged and decreed that the decree of said Circuit Court be and it hereby is amended by inserting the following clause:

"Nothing in this injunction shall prevent or is intended to prevent, or enjoin this defendant from handling, using and selling rubber tires and rims covered by the Grant patent, manufactured by the Goodyear Tire & Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the Federal Courts

of the Sixth Circuit; or manufactured by the Kokomo Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the District of Indiana, Seventh Circuit, or manufactured by the Victor Rubber Tire Company, under a judicial decree in a litigation in the Federal Courts in the Sixth Circuit, wherein in such litigations it has been judicially determined that the said Grant patent is invalid and void,"

and as so amended is affirmed with costs.

A. C. C.

It is further ordered that a Mandate issue to the said Circuit Court in accordance with this decree.

Endorsed: United States Circuit Court of Appeals, Second Circuit. Cons. Rubber Tire Co. & ano. *vs.* Diamond Rubber Co. Order for Mandate. United States Circuit Court of Appeals Second Circuit. Filed Jun- 23 1908 William Parkin Clerk.

At a stated term of the United States Circuit Court of Appeals for the Second Circuit held at the Court Rooms in the Post Office Building, City of New York on the 17th day of June 1908.

Present: Hon. E. Henry Lacombe, Hon. Alfred C. Coxe, Hon. Walter C. Noyes, Judges.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

A petition for a rehearing and for other relief having been filed herein by counsel for the defendant-appellant, Upon consideration thereof it is

Ordered that said petition for rehearing be and it hereby is denied.

Further ordered that the mandate herein be and hereby is stayed until August 1st, 1908, with leave to apply to any member of the court for an extension of the stay on proof that a petition for a writ of certiorari has been duly filed.

Further ordered that the petition to send the printed records in the Goodyear, Kokomo and Firestone cases to the Supreme Court of the United States as physical exhibits be and hereby is denied, without prejudice to any such application that may be made to said Supreme Court or a justice thereof.

ALFRED C. COXE.

Endorsed: United States Circuit Court of Appeals Second Circuit. Consolidated Rubber Tire Co. & ano. *vs.* Diamond Rubber Co. of N. Y., order. United States Circuit Court of appeals Second Circuit. Filed Jun- 23 1908 William Parkin Clerk.

UNITED STATES OF AMERICA,
Southern District of New York, ss:

I, William Parkin, Clerk of the United States Circuit Court of Appeals for the Second Circuit, do hereby Certify that the foregoing pages numbered from 1 to 772 inclusive, contain a true and complete transcript of the record and proceedings had in said Court, in the case of Consolidated Rubber Tire Company & another against Diamond Rubber Company of New York as the same remain of record and on file in my office.

In testimony whereof, I have caused the seal of the said Court to be hereunto affixed, at the City of New York, in the Southern District of New York, in the Second Circuit, this 24th day of June in the year of our Lord One Thousand Nine Hundred and eight and of the Independence of the said United States the One Hundred and thirty-second.

[Seal United States Circuit Court of Appeals,
Second Circuit.]

WM. PARKIN, *Clerk.*

POOR COPY

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,

against

THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Petition of the Complainants, Appellees, That the Mandate of This Court Be Issued on August 1, 1908, *and Brief in Support of the Petition.*

F. P. Fish, Thomas W. Bakewell, C. W. Stapleton, Staley & Bowman, Counsel for Appellees.

[Stamped:] United States Circuit Court of Appeals, Second Circuit. Filed Jul- 15, 1908. William Parkin, clerk.

Charles W. Stapleton, Counselor-at-Law, 220 Broadway, New York.
Telephone 5473 Cortlandt.

NEW YORK, *July* 14*th*, 1908.

To the Honorable the Judges of the Circuit Court of Appeals for the Second Circuit.

GENTLEMEN: On June 3rd last you ordered a decree in favor of the Grant rubber tire patent and on June 16th following upon defendant's ex parte application you ordered an amendment staying the issuing of the mandate until August 1st with leave for defendant to apply to any member of the court for a further stay on proof that a petition for writ of certiorari has been filed.

We desire to protest against any further stay of the mandate as unfair and unjust to the complainants and for the reasons and upon the grounds set forth in the petition and brief to which we beg to call your Honors' most serious consideration.

Very truly yours,

FREDERICK P. FISH,
THOMAS W. BAKEWELL,
STALEY & BOWMAN,
By CHAS. W. STAPLETON.

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,
against
THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Petition of the Complainants, Appellees, That the Mandate of This Court Be Issued on August 1, 1908.

To the Honorable the Judges of the said Court:

The Consolidated Rubber Tire Company and the Rubber Tire Wheel Company, Complainants, Appellees herein, respectfully represent:

1. That on March 2, 1908, at final hearing on pleadings and proofs, the Circuit Court in the above-entitled cause entered a decree adjudging letters patent of Arthur W. Grant, No. 554,675, here in suit to be valid and to have been infringed by the defendant, and ordering an injunction and an account of damages and profits, and on the same day the defendant having presented to the Circuit Court its petition for appeal to this Court, and having prayed therein that the said appeal might be made a supersedeas, the Circuit Court allowed the appeal and ordered that a bond be given by the defendant in the penal sum of $10,000, "which, when given, shall stand and act as a supersedeas until final determination of this action, provided that, if the proceedings on appeal are unreasonably delayed, an application may be made to vacate the supersedeas;" and ordered further "that the proceedings be suspended in the above cause in this Court during the pendency of said appeal."

2. That in pursuance of said appeal, the said cause came on for hearing before this Court on the transcript of the record from the Circuit Court, and having been argued by counsel, this Court, on June 3, 1908, filed an opinion, affirming with costs the decree of the Circuit Court.

3. Thereafter the defendant appellant filed a petition for rehearing in this Court, and on June 16, 1908, this Court entered an order denying the said petition for rehearing, ordering an amendment of the decree of the Circuit Court in certain particulars, and further ordering as follows:

"The mandate is stayed until August 1, 1908, with leave to apply to any member of the Court for an extension of the stay on proof that a petition for a writ of *certiorari* has been duly filed."

4. The extension of the stay of the mandate after August 1, 1908, will work hardship and irreparable injury to your petitioners, the complainants herein, for the following reasons:

The Consolidated Rubber Tire Company is the principal complainant, the Rubber Tire Wheel Company having been inactive since 1899, when the Consolidated Rubber Tire Company was organized and took over the greater portion of its business and assets.

Substantially the entire business of the Consolidated Rubber Tire Co. is the manufacture and sale of rubber tires covered by the patent in suit. Said company was organized for that purpose, and it and its predecessor paid for the Grant patent in suit upwards of one million dollars ($1,000,000) in cash, besides other valuable considerations, and bought the patent in good faith, knowing that the tire described therein was one of unusual merit, and believing, under advice of counsel, that the patent was valid.

The Consolidated Rubber Tire Company is the largest dealer and manufacturer of solid rubber carriage tires in the United States. It has always manufactured a high grade tire, and has received, and is to-day receiving for its product higher prices than are obtained by others engaged in this industry, although the prices thus received have been reduced below the prices to which said company is justly entitled, owing to the unlicensed infringement and competition of the defendant and others.

The litigation on the patent in suit began in the year 1896, with a suit brought by the Rubber Tire Wheel Company against the Columbia Pneumatic Wagon Wheel Company in the United States Circuit Court for the Southern District of New York, wherein the patent was sustained at final hearing (91 Federal Reporter, 973); and since that date the complainants have been constantly engaged in litigation in the endeavor to establish their right. The history of this litigation is stated in the opinion of this Court reported in 151 Federal Reporter, 237.

Said litigation has cost the Consolidated Rubber Tire Company and its predecessor more than $100,000 in cash, which it has paid out in costs of suit, printing records and briefs, compensation to experts and counsel, and other expenses.

Your petitioners on information and belief state that the defendant herein was organized under the laws of New York, January 10th, 1905, with a capital stock of $10,000 only; and that it was organized by and is now owned and controlled by "The Diamond Rubber Company," an Ohio corporation with its principal office at Akron, Ohio. The executive officers of said Ohio corporation and of the New York corporation, the defendant herein, are substantially if not entirely the same, and the defendant is really but a subsidiary and selling company for the Ohio corporation of the same name. The said parent company, the Diamond Rubber Company, the Ohio corporation and also the Goodyear Tire and Rubber Company, Kokomo Rubber Company, and Victor Rubber Company, since the decision in the Circuit Court of Appeals for the Sixth Circuit in the Goodyear case adjudging said Grant patent invalid, have all taken licenses and paid royalties under said patent to complainant the Rubber Tire Wheel Company, and did so for the period of about one year, at the end of which time their respective licenses terminated.

The defendant, the Diamond Rubber Company of New York, and its parent Company, the Ohio Corporation of the same name, are engaged in the sale of a variety of manufactured rubber articles, including pneumatic tires, solid tires of various types, rubber buffers for railroad use, rubber surgical instruments, etc.; and sales of solid

rubber tires of the type mentioned in the decree herein constitute only a small part of the defendant's business. Your petitioners are informed and believe that they constitute only about ten per cent. of the defendant's total sales.

The patent in suit, being dated February 18, 1896, will expire on the 18th of February, 1913; and on the 1st of August, 1908 will have only about four and one-half years of its original term remaining. If the complainants are secured the exclusive rights under the patent during the said four and one-half years they can hardly hope to recover more than the outlay which they have made in and about this litigation, but if their exclusive rights under the patent are further postponed, as will be the case if an injunction does not issue against said defendant, great loss and hardship will result to them, and the business which they have built up under the said patent with years of diligent effort and rigid economy, not only in this country but throughout the civilized world, will be affected and damaged in such a way that it cannot be repaired. Complainants will not only be prevented from restraining this defendant from further infringement of the patent pending the stay of the mandate, but will be unable to obtain relief against other infringers, so that the trade will be demoralized, and prices necessarily reduced to an unfair and unreasonable extent.

Your petitioners therefore pray that any application made or to be made hereafter by the defendant appellant for a stay of the mandate after August 1, 1908, be refused, and that the mandate be ordered to issue on that date, to the end that irreparable injury to your petitioners may be averted and that your petitioners may be permitted to enjoy the exclusive rights under the Letters Patent in suit.

CONSOLIDATED RUBBER TIRE COMPANY,
By FREDERICK A. SEAMAN, *Secretary.*
THE RUBBER TIRE WHEEL COMPANY,
By FREDERICK A. SEAMAN, *Secretary.*

F. P. FISH,
THOMAS W. BAKEWELL,
C. W. STAPLETON,
STALEY & BOWMAN,
For Complainants, Petitioners.

COUNTY OF NEW YORK,
State of New York, ss:

Frederick A. Seaman being duly sworn says that he is the Secretary and Treasurer of the Consolidated Rubber Tire Company, one of the above named petitioners; since 1899 he has had charge of its records and documents; he is personally familiar with its history and business affairs and also with the history and business affairs of its predecessor, the said Rubber Tire Wheel Company; that he has read the foregoing petition and is familiar with the contents thereof, and that the statements therein made are true.

FREDERICK A. SEAMAN.

Sworn to and subscribed before me this first day of July, 1908.

——— ———.

United States Circuit Court of Appeals for the Second Circuit.
In Equity.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,
vs.
THE DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Order.

This cause coming on to be heard, as to a certain matter appearing in reserve in the order of this Court entered June 16, 1908, as follows:

"The mandate is stayed until August 1, 1908, with leave to apply to any member of the court for an extension of the stay on proof that a petition for writ of certiorari has been duly filed:"

and it now appearing to the Court that such proof is here present, and that a petition for a writ of certiorari has been filed in the Supreme Court of the United States by the above named defendant-appellant, and that a certified transcript of the record in this cause has been made by the Clerk of this Court, and has been filed by defendant-appellant in the office of the Clerk of the Supreme Court of the United States, at Washington, D. C.

It is now therefore ordered that the mandate be and is stayed until the final disposition of said petition for writ of certiorari in the Supreme Court of the United States.

E. HENRY LACOMBE, *U. S. C. J.*

New York City, N. Y., July 30, 1908.

Endorsed: U. S. Circuit Court of Appeals Second Circuit. In Equity. Consolidated Rubber Tire Company et al. vs Diamond Rubber Company of New York. Order staying Mandate. Offield, Towle & Linthicum, Monadnock Block, Chicago, Ill. United States Circuit Court of Appeals Second Circuit. Filed Jul- 31, 1908. William Parkin, Clerk.

United States Circuit Court of Appeals, Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
vs.
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Upon reading and filing the annexed affidavit of Philip B. Adams, it is

Ordered That the Clerk of this Court immediately forward by

express, the physical exhibits in the above entitled action, to wit, the "Goodyear Record" the "Firestone Record" and the "Kokoma Record" to the Hon. James H. McKenney, Clerk of the Supreme Court of the United States, at Washington, D. C. forthwith.

E. H. L.

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

STATE OF NEW YORK,
County of New York, ss:

Philip B. Adams, being first duly sworn, says that he is one of the attorneys of record for the defendant in the above entitled action and that a petition for writ of certiorari to the Supreme Court of the United States is to be presented to that Court to-day or to-morrow. Mr. Charles K. Offield is counsel in this case and has had charge of the preparation and argument of the case from its inception and is present in Washington to present said petition for writ of certiorari at this time; that the deponent has just received the following telegram from Mr. Offield:

"Philip B. Adams, Attorney, 21 Park Row, New York, N. Y.:

Express to-day care James H. McKenney Clerk Supreme Court all exhibits wheels and tires Consolidated Diamond case also Goodyear Firestone Kokoma records asserted to by Bakewell answer.

C. K. OFFIELD."

The deponent asks this Court to enter an order directing the Clerk of the Court to send the physical exhibits, the "Goodyear Record" the Firestone Record" and the "Kokoma Record" to the Hon. James H. McKenney, Clerk of the Supreme Court of the United States forthwith.

PHILIP B. ADAMS.

Sworn to before me this 12th day of October, 1908.

WM. PARKIN,
Clerk U. S. Circuit Court of Appeals, Second Circuit.

Endorsed: United States Circuit Court of Appeals 2nd Circuit. Consolidated Rubber Tire Company etc. Plaintiff against Diamond Rubber Company of New York, Defendant. Affidavit and order. Philip B. Adams attorney for defendant. Office and P. O. Address 21 Park Row, Borough of Manhattan, New York City. United States Circuit Court of Appeals, Second Circuit. Filed Oct. 12, 1908. William Parkin, Clerk.

Circuit Court of Appeals, Second Circuit.

CONSOLIDATED RUBBER TIRE CO. and RUBBER TIRE WHEEL CO.,
Complainants-Appellees,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Affidavit and Notice of Motion to Complete the Record on Return to Writ of Certiorari.

Charles W. Stapleton, Solicitor for Complainants-Appellees, 220 Broadway, Borough of Manhattan, New York City.
Staley & Bowman, Thos. W. Bakewell, Frederick P. Fish, Counsel.

[Stamped:] United States Circuit Court of Appeals, Second Circuit. Filed Dec. 13, 1908. William Parkin, clerk.

United States Circuit Court of Appeals, for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Please take notice that upon the affidavit of Charles W. Stapleton, verified November 30th, 1908, a copy of which is herewith served upon you, and upon the entire record on appeal in this case; the records in the Goodyear, Kokomo and Firestone cases described in the stipulation at pages 157 and 158 of the record on appeal herein; the briefs of the parties in the Circuit Court and in this Court; the writ of certiorari granted, and mandate issued by the United States Supreme Court, and all the records, exhibits, certificates and papers herein on file with the Clerk of this Court, and with the Clerk of the Supreme Court,

I shall move this Court at a session thereof for the hearing of motions to be held in the General Post Office Building, Borough of Manhattan, City of New York, on December 7th, 1908, at the opening of the Court on that day, or as soon thereafter as counsel can be heard for an order directing the Clerk of this Court to certify and return in response to the writ of certiorari granted herein the entire records of the Goodyear, Kokomo and Firestone cases mentioned herein, as a part of the depositions and records in this case, or such portions thereof as counsel for the respective parties may designate in writing to the Clerk, and for such other and further relief as may be just.

CHARLES W. STAPLETON,
Solicitor for Complainants-Appellees.
STALEY & BOWMAN.
THOS. W. BAKEWELL,
FREDERICK P. FISH,
Counsel.

To Philip B. Adams, Solicitor for Defendant-Appellant.

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

STATE AND COUNTY OF NEW YORK, *ss:*

Charles W. Stapleton, being duly sworn, says, that he is the solicitor of record for the complainants herein. That on June 3d, 1908, this Court affirmed a decree of the Circuit Court for the Southern District of New York sustaining the validity of United States Patent #554,675 for improvement in rubber tires.

That a writ of certiorari in said case has been granted by the Supreme Court, and the Clerk of this Court is about certifying the record of the case to the Supreme Court in obedience to the mandate of that Court.

That in this case the defendant put in evidence the entire printed records of three earlier cases involving the validity of said patent, and at the same time it was mutually stipulated that the depositions and proofs contained therein should be used in this action with the same force and effect as though they had been regularly taken herein.

That said records of said three old cases were not reprinted in this case with the new depositions taken directly in this case, but by mutual consent old existing printed records of the same were used on the final hearing of this in this Court and in the Court below, were present in Court, were referred to by counsel in their arguments, and were taken and treated in all respects as depositions in this present case.

That deponent is advised by said Clerk that it is his intention to certify and return as the record in this case only the new depositions taken herein with the opinion decree and the other documents incident to the determining of this case in this Court, and to omit from his return the records and depositions taken in the older cases and stipulated into this case.

That said stipulation appears on page 157 of the record herein and is as follows:

"Defendant's counsel here offers in evidence the entire records and
" exhibits of the several cases identified by the order and decree of
" Judge Holt entered herein December 2nd, 1907, as follows:

"Printed record in the Goodyear case in the Sixth Circuit of this
" complainant against the Goodyear Tire & Rubber Company, and
" requests that the same may be marked 'Defendant's Exhibit Ap-
" peal Record Goodyear Case.'

"Also entire printed record and exhibits in the Kokomo case, be-
" ing a case of this complainant against the Kokomo Rubber Com-
" pany in the Seventh Circuit, and requests that the same may be
" marked 'Defendant's Exhibit Appeal Record Kokomo Case.'

"Also entire printed record and exhibits in The Firestone case, "being a case of this complainant against the Firestone Tire & "Rubber Company in the Second Circuit, and requests that the "same may be marked 'Defendant's Exhibit Appeal Record Fire-"stone Case.'

"It is hereby stipulated and agreed between counsel for the re-"spective parties that the depositions and other proofs contained in "said records may be used in this case with the same force and ef-"fect, as tho' said various depositions and other proceedings con-"tained in the said records had been duly and regularly taken "herein; that the complainant's part of said records may be treated "and used as a part of complainant's record herein, and that the "defendant's part of said records may be treated and used as a part of "defendant's record herein, as tho' the same were proceedings had — "depositions taken in this cause; and that the printed copies of the "three records offered in evidence herein are the printed records "upon which the cases, respectively, were heard and decided."

Deponent further says that heretofore on October 12, 1908, defendant applied *ex parte,* and obtained an order from this Court directing that the records of said old cases be forwarded to the Clerk of the Supreme Court at Washington, which was done, as deponent is informed by the Clerk of this Court, accompanied by a letter that they were forwarded by order of the Court as exhibits in this case, and not as depositions; copies of the order and affidavit upon which the same was granted, are hereto annexed, and made a part hereof. That said application was made, said order granted, and said records forwarded without notice to complainants and entirely *ex parte.*

Deponent further states that soon after the writ of certiorari was allowed herein, deponent's associate, Mr. Bakewell, endeavored by correspondence and at personal interviews to agree with defendant's attorneys upon such portions of the record covered by said stipulation as they deemed essential to be printed and certified to the Supreme Court, and that Mr. Bakewell suggested to defendant's counsel that each party designate such portion of the stipulated records as they deemed important should be certified to the Supreme Court, and thus save expense and avoid encumbering the record with duplicate and useless matter.

That letters, copies of which are hereto annexed and made a part hereof, passed between Mr. Bakewell and defendant's attorneys on this subject.

That deponent is advised by Mr. Bakewell that he (Bakewell) had a conversation with defendant's counsel, Mr. Offield, in which Mr. Bakewell pointed out such portions of the old stipulated depositions as he deemed important should be printed as a part of the record of this case, and Mr. Offield emphatically and absolutely declined to consent that those portions of the stipulated depositions be certified to the Supreme Court to be considered as depositions, or as being in this Diamond case, except as they are now before the Court as exhibits, and complainant's counsel have done all in their power to carry out the provisions of the stipulation and shorten the record.

That complainant's new proofs in this case are for the greater part merely formal, consisting of proof only of infringement, of title and two short depositions to identify and explain demonstrations—and this is so because of the said stipulation which put into this case as depositions herein, the depositions and records in the Firestone, Kokomo and Goodyear cases, and which cover the entire ground of controversy.

That while on the hearing of this case, in this Court, these stipulated depositions were considered and treated as regular depositions in this case; it seems they will not be so considered and regarded by the Supreme Court, unless they are certified to be a part of the printed record in this Diamond case and twenty-five printed copies supplied; otherwise they will be treated as merely physical exhibits; and as substantially all of complainant's essential proofs are contained in such old stipulated depositions, it is, of course, of the utmost importance—in fact, absolutely essential for complainants—that such stipulated depositions or, at least, a portion thereof be returned by this Court as regular depositions in this case so that they may be regularly printed and submitted to the Supreme Court in the usual way, and not merely as physical exhibits.

Complainants therefore pray the Court to direct the Clerk to certify the entire records of the Goodyear, Kokomo and Firestone cases to the Supreme Court as a part of the record in this case—or such portions thereof as counsel for the respective parties may designate in writing to the Clerk.

CHARLES W. STAPLETON.

Sworn to before me this 30th day of November, 1908.

ADELE V. JUILLERAT,
Notary Public, 32, New York Co.

Correspondence.

OCTOBER 31, 1908.

DEAR MR. OFFIELD:

With reference to the pending writ of certiorari in Consolidated Rubber Tire Co. vs. Diamond Rubber Co., you will notice on pages 157-158 of the Court of Appeals record, a stipulation that the records in the prior cases—Goodyear, Kokomo and Firestone—shall be part of the record in the present case, and that the depositions shall be used herein. This undoubtedly makes it necessary to print these depositions. I should like to know what you intend to do about this matter. Of course, I do not desire to impose upon you the great burden of expense involved in reprinting all these records. I do not see that any of us would gain by this; but we might make a stipulation incorporating into the Supreme Court record such parts of the records in the previous cases as each of us desires to use.

Please let me know your views of this subject at an early date, so that we may take suitable action.

Very truly yours,

THOMAS W. BAKEWELL.

NOVEMBER 5, 1908.

DEAR MR. BAKEWELL:

Your favor of the 31st ult. duly received. All three of the records, namely—Defendant's Exhibit Appeal Record Goodyear Case, Defendant's Exhibit Appeal Record Kokomo Case and Defendant's Exhibit Appeal Record Firestone Case, were present in the pending litigation of the Consolidated Rubber Tire Co. and the Rubber Tire Wheel Co. vs. The Diamond Rubber Company of New York, on certiorari petition granted in the Supreme Court of the United States, as physical exhibits and were so treated, not only in the argument of the case before Judge Holt at the Circuit, but in the argument of the case in the Court of Appeals, and all of these three record exhibits were sent up, and are now present in the Supreme Court of the United States, as physical exhibits.

I have not the slighest intention of printing any of these records, or paying a dollar for their reprinting, and I do not think that you can impose upon me or my clients any such burden of expense.

I desire now to state, and to be so understood, so that there can be no mistake as to the matter hereafter, either upon your part or mine, that I propose to argue the case in the Supreme Court of the United States, upon the record as there made, against the Diamond Rubber Company of New York, both upon your part and upon mine, and while the presence of these records may be valuable as physical exhibits, I do not propose that either of them shall stand as an embarrassment to the record as made in my case.

The stipulation that you refer to is general in its terms, and has not so far been acted upon by either parties in the trial of the case below, except as might be implied from the presence of the three records as physical exhibits.

To be a little more explicit, I certainly have not the slightest intention that you shall take, for example, the Firestone Record, and argue the case in the Supreme Court of the United States, upon the ground and the theory that the Firestone Record is the record in my case.

I do not gather from your letter to what extent you might desire to make use of these old records, or portions of them, in the Supreme Court. If you will send me such parts of each of these records as you may desire to use, I will consider them and such action upon your part would necessitate probably a selection of a certain portion of each record for my case, and perhaps we can harmonize the matter in this way.

Yours very truly,

C. K. OFFIELD,
For O. T. L.

NOVEMBER 9, 1908.

Charles K. Offield, Esq.

DEAR SIR: I have your letter of Nov. 5th. You have entirely misunderstood the purpose of my letter, and I do not think that there is any justification for the rather brusque tone in which you phrase your reply. My purpose was not to burden either party with

expense, but to save expense. The stipulation requires that the Kokomo record, the Goodyear record and the Firestone record are all actually incorporated, not as physical exhibits, but as part of the record in this case; and I was suggesting to you that it would save expense if we should agree that instead of your printing the entire records, which would be very burdensome and costly, each party select the parts which he desired to have printed. I think that this would save trouble and expense, and I should be glad to hear from you further on this subject. If you assent to this proposition, I will take pleasure in designating the parts that I should like to have printed, and they will not be bulky or add largely to the expense. On the other hand, if you are unwilling to assent to this, I shall be forced against my will and to my regret to take proceedings to have the entire record certified to the Supreme Court. I should regret this because of the burden of expense which it would put upon the case and which primarily, at least, would have to be borne by your client.

Very truly yours,

THOMAS W. BAKEWELL.

NOVEMBER 14, 1908.

Thomas W. Bakewell, Esquire.

DEAR SIR: Your favor of the 9th inst. duly received. I had no intention of introducing a "brusque" tone element into my correspondence with you or your office. No matter what the stipulation says, as quoted by you, the fact is that the Kokomo, Goodyear and Firestone records have been treated as physical exhibits and as separate units so far in the litigation of the Consolidated Rubber Tire Co. of New York, in the Southern District of New York. They were so treated at the Circuit before Judge Holt, and so treated in the two cases, injunction and final hearing, where they were present in the U. S. Circuit Court of Appeals for the Second Circuit and they are now present as physical exhibits even by your endorsement and assent, in the Supreme Court of the United States. I do not believe you can obtain any order from any Court to have these entire separate records certified to the Supreme Court. They are now in the Supreme Court on file, and in custody of that Court, and as far as I can see, without any opportunity for such certification. I do not believe that the Supreme Court would make any such order and return the separate physical exhibits for certification, nor do I believe that the Supreme Court will ever order these records to be printed by my clients, nor do I believe that you could yourself obtain permission from the Supreme Court to print these exhibits separately at your own expense. Now, please understand me, I do not know that I will have any particular objections to your selecting such parts of these separate records that you may desire to have printed, but I do not propose to assent to this proceeding until I see those parts as to subject matter and their relation to each other. I can see, however, that disjointed and misjointed parts could be selected from the respective records by you, or your associates, that I would not for a moment consent to their printing, or use in that

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way, and I presume that you would have some such feeling in parts that I might select and submit to you, but if you designate the parts of the record that you desire to have printed, and I can see that they are a fair selection and for no other object in view except to present correctly the facts in this case to the Court, I will select such answering or associate or explanatory parts that I may wish to use from these same records, and necessitated by your selection, and I really think that we can perhaps agree as to these selections by both parties, but unless this is done I shall take my chances as to what the Court will order done in the matter.

Very truly yours,

C. K. OFFIELD,
For O. T. L.

NEW YORK CITY, *November* 21, 1908.

William Parkin, Esq., Clerk U. S. Circuit Court of Appeals.

MY DEAR SIR: In Consolidated Rubber Tire Co. & ano. vs. Diamond Rubber Co. of New York counsel for complainants learn that you are about to certify the record to the Supreme Court of the United States, a writ of certiorari having been granted in the case by that Court. We also further understand that it is your intention to certify merely the printed testimony taken in the Diamond case proper, and to omit the record and depositions taken in other cases and stipulated into the Diamond case as shown on page 157 of the record in the Diamond case, to which stipulation we beg to call your attention and request that you certify as a part of the record in the Diamond case and as depositions considered by the Circuit Court of Appeals, the entire record in the Firestone case mentioned in said stipulation, counsel having failed to agree to exclude any portion thereof.

Very truly yours,

CHAS. W. STAPLETON.

NOVEMBER 23, 1908.

Charles W. Stapleton, Esq., City.

CONSOLIDATED RUBBER TIRE CO.
vs.
DIAMOND RUBBER CO.

DEAR SIR: In reply to your letter of the 21st inst., I beg to say that it is not my intention to include in the return to the writ of certiorari the records and depositions mentioned in the stipulation on page 157 of the printed record in this case. My reasons for omitting them are that they were not certified up to this court from the Circuit Court as a part of the record, and Judge Coxe in his opinion and order on the motion to have them sent as physical exhibits, to the Supreme Court treated them as not being part of the record on which the case was heard in this Court.

Very truly yours,

WM. PARKIN, *Clerk*.

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Ex Parte Order.

United States Circuit Court, Southern District of New York.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

STATE OF NEW YORK, *County of New York, ss:*

Philip B. Adams, being first duly sworn, says that he is one of the attorneys of record for the defendant in the above-entitled action and that a petition for writ of certiorari to the Supreme Court of the United States is to be presented to that Court today or tomorrow. Mr. Charles K. Offield is counsel in this case and has had charge of the preparation and argument of the case from its inception and is present in Washington to present said petition for writ of certiorari at this time; that the deponent has just received the following telegram from Mr. Offield:

"Philip B. Arams, Attorney, 21 Park Row, New York, N. Y.:

Express to-day care James H. McKenney Clerk Supreme Court all exhibits wheels and tires Consolidated Diamond case also Goodyear Firestone Kokoma Records asserted to by Bakewell answer.

C. K. OFFIELD."

The deponent asks this Court to enter an order directing the Clerk of the Court to send the physical exhibits, the "Goodyear Record," the "Firestone Record" and the "Kokoma Record" to the Hon. James H. McKenney, Clerk of the Supreme Court of the United States forthwith.

PHILIP B. ADAMS.

Sworn to before me this 12th day of October, 1908.

WM. PARKIN,
Clerk U. S. Circuit Court of Appeals, Second Circuit.

United States Circuit Court of Appeals, Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
against
DIAMOND RUBBER COMPANY OF NEW YORK, Defendant.

Upon reading and filing the annexed affidavit of Philip B. Adams it is

Ordered, That the Clerk of this Court immediately forward by express, the physical exhibits in the above-entitled action, to wit, the "Goodyear Record," the "Firestone Record," and the "Kokoma

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Record," to the Hon. James H. McKenney, Clerk of the Supreme Court of the United States, at Washington, D. C., forthwith.

E. H. L.

United States Circuit Court of Appeals for the Second Circuit.

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY, Complainants-Appellees,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

Before Lacombe, Coxe, and Noyes, Circuit Judges.

The Clerk should certify as a part of the record in this case the testimony of the witnesses taken in the Firestone case, or so much of it as both sides shall by stipulation agree to. The testimony of each witness shall be prefaced with the statement that he was examined as a witness for complainant or defendant (as the fact may be) in the Firestone case; and that his testimony then given was read into the record in this case by complainant or defendant herein (as the fact may be) under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

Endorsed: United States Circuit Court of Appeals Second Circuit. Consolidated Rubber Tire Co. and ano. vs. Diamond Rubber Co. Memo. United States Circuit Court of Appeals Second Circuit. Filed Dec. 14, 1908. William Parkin, Clerk.

At a Term of the United States Circuit Court of Appeals for the Second Circuit, Held at the General Post Office Building, in the Borough of Manhattan, City of New York, N. Y., on the 14th day of December, 1908.

Present: Hon. E. H. Lacombe, Hon. A. C. Coxe, Hon. W. C. Noyes, Judges.

CONSOLIDATED RUBBER TIRE COMPANY and ANO., Plaintiff-Appellee-,

vs.

DIAMOND RUBBER COMPANY OF NEW YORK, Defendant-Appellant.

On reading and filing the affidavit of Chas. W. Stapleton, verified November 30th, 1908, and the notice of motion to complete the record and return to the writ of certiorari granted herein by the Supreme Court, and after hearing counsel for the respective parties, it is now on motion of Chas. W. Stapleton, solicitor for complainants,

Ordered that the Clerk certify as a part of the record in this case, the testimony of the witnesses taken in the Firestone case, or so much of it as both sides shall by stipulation agree to. The testimony of

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each witness shall be prefaced with the statement that he was examined as a witness for complainant or defendant (as the fact may be) in the Firestone case; and that his testimony then given was read into the record in this case by complainant or defendant herein (as the fact may be) under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

E. H. L.

Endorsed: Cons. Rubber Tire Co. vs. Diamond Rubber Co. Order. United States Circuit Court of Appeals, Second Circuit. Filed Dec. 26, 1908. William Parkin, Clerk.

United States Circuit Court, Southern District of New York.

In Equity.

THE CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
vs.
FIRESTONE TIRE AND RUBBER COMPANY, Defendants.

NEW YORK, *April* 27, 1905.

Depositions of witnesses taken in the above entitled cause on behalf of complainants, before John A. Shields, Esq., Standing Examiner, at the office of John R. Bennett, 31 Nassau Streets, New York City, in pursuance of the annexed notice and the equity rules, beginning at 10:30 a. m. on Thursday, April 27, 1905.

Present: John R. Bennett, Esq., Paul A. Staley, Esq., C. W. Stapleton, Esq., for Complainants. Charles C. Linthicum, Esq., for defendant.

Joseph P. Livermore was examined as a witness on behalf of complainants in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

And thereupon JOSEPH P. LIVERMORE, a witness produced on behalf of complainants, being first duly sworn, deposes and testified as follows, in answer to questions by complainants' counsel, to wit:

Q. 1. Please state your name, age, residence and occupation.

A. Joseph P. Livermore; I am fifty years old; reside in Cambridge, Mass., and I am a solicitor of patents and mechanical expert having my office in Boston, Mass.

Q. 2. Please state what experience you have had in connection with patents and mechanics generally, and especially in connection

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with rubber tires for vehicles, or rubber tired wheels that would enable you to testify concerning the mechanical construction and operation of devices of this character, and as to the comparisons of such mechanical construction one with the other.

A. I received a technical education at the Lawrence Scientific School of Harvard University where I was graduated as a civil engineer in 1877, having previously been graduated at Harvard College in 1875.

Since the beginning of 1879, I have been practicing as a solicitor of patents, and practically all of my time has been occupied in studying machinery and appliances and methods employed in the industrial arts, and in analyzing mechanical structures for the purpose of ascertaining and explaining the essential nature of the contrivances therein embodied.

During the past twenty years a large part of my time has been devoted to the study of descriptions and drawings of mechanical appliances, and to the analysis and comparison of the contrivances therein represented for the purpose of advising as to whether or not such appliances contain features of novelty or features forming the subject of letters-patent, and for the purpose of preparing and giving testimony in patent cases.

I have had occasion to study the construction and mode of operation of rubber tires for vehicle wheels and have testified in several cases relating to that subject.

Q. 3. Have you examined, and do you understand letters-patent No. 554,675, being the patent in suit?

A. I have examined that patent, and understand the construction and mode of operation of the wheel tire therein shown and described.

Q. 4. Will you please explain the construction, purpose and mode of operation of the structure shown and described in the said patent, and state what elements and characteristics thereof are referred to and set forth in the claims of the said patent?

A. The patent in suit which I will call the Grant patent states that the invention of the patentee "relates to improvements in rubber tired wheels, and it especially relates to wheels designed for use on ordinary vehicles, such as wagons, buggies, and carriages."

The general purpose of a rubber tire in connection with a vehicle is well understood, it being to afford an elastic cushion between the wheel and the road surface, and thus to diminish the shocks and jars that are transmitted to the vehicle and its occupants when a non-elastic wheel tire such as a steel tire is used, the result being added comfort to the occupant of the vehicle and longer life to the vehicle, and almost total elimination of the rattle and noise that is produced when steel tired vehicles are drawn over pavements or other hard and irregular road surfaces.

It is of course necessary for a practical rubber wheel tire that the rubber should remain securely attached to the wheel rim, and should be as immune as possible from cutting by contact with irregular surfaces on the road bed and the construction shown and described in the Grant patent is devised mainly with the view to attaining these results of secure fastening of the rubber tire to the

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wheel rim and immunity of the rubber from cutting or excessive wear under the conditions incident to the use of the vehicle.

The tire shown and described in the Grant patent comprises three principal components or elements, each of which has certain specified features of construction for co-operation with the other components for the attainment of the properties necessary for secure attachment and durability of the rubber.

The three principal components are, first, a metallic rim, which is secured to the wooden felly or rim of the wheel much the same as an ordinary steel or iron tire is secured thereto; second, the rubber tire proper, which constitutes the actual bearing or tread surface of the wheel when in use; and third, a fastening device by which the rubber is securely held in position in the rim.

The essential characteristics of each of these elementary components by which all co-operate to attain the desired result are shown and described as follows in the Grant patent: The metallic rim is in the form of channel, or has a bottom portion which lies upon the felly of the wheel and two side flanges rising from the bottom portion and forming therewith a channel to receive the rubber, the said flanges being inclined to the bottom portion and flaring outwardly so that the space in the channel is widest at the outer periphery of the flanges, and narrowest at the bottom of the channel where the flanges adjoin the bottom portion of the rim piece at an obtuse angle thereto.

The rubber is formed of a strip of a length a little more than the circumference of the rim, and is made of peculiar sectional shape, the inner part which is to lie in the channel of the rim being of the same shape as the flaring channel while the outer part which projects radially beyond the rim and serves as the tread or bearing for the wheel has its sides at an angle to the sides of the inner part, the sides of the outer part converging in the direction radially outward from the wheel, and finally meeting in a curve or arc of a circle of much smaller diameter than the width of the rim.

The side of the inner part of the rubber (or unexposed part, as it is called, because it is in contact with and covered by the channel-shaped rim) is thus at an angle to the side of the outer part forming the actual tread or bearing for the wheel, and the width of the rubber is greatest on the line from the angle between the inner and outer parts at one side to the corresponding angle at the other side, and the sides of the unexposed portion of the rubber are not so high or deep as the side flanges of the channel, so that when the rubber is seated in the rim the angle between the inner and outer parts of the rubber is within the channel, or nearer the center of the wheel, than the periphery of the flange of the channeled rim. The rubber has longitudinal holes extending entirely through it, and shown as two in number, said holes being intended to receive the fastening wires, and being located in the inner or unexposed part of rubber so that the fastening wires when placed therein will be below or radially within the outer periphery of the flanges of the channel-shaped rim.

The third component of the tire, namely, the fastening device, is composed of independent wires passed through the openings in the rubber and having their ends drawn together and united so that

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each wire forms an endless tie or band extending entirely around the periphery of the wheel, and completely imbedded in the rubber, the circumferential length of said tie being somewhat greater than the circumferential length of the rim at the bottom of the channel, and a trifle less than the circumferential length of the rim at the outer edges of the flaring side flanges thereof.

The bottom portion of the rubber component of the tire that lies within the channel is re-inforced with a canvas strip which covers the entire bottom and which may project slightly along the sides of the inner or unexposed portion of the tire, but as stated in the specification, does not in any case extend up as far as the angle or corner at the junction of the inner and outer side surfaces of the tire.

The specification of the Grant patent points out the purpose and effect of some of the above described features in the contribution of each to the attainment of the general results aimed at by the co-operation of all of these features, as follows: (see page 1, line 83).

"The tire has been described thus minutely because the constructions described are important. By having the sides of the exposed and unexposed portion of the tire formed inclined and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the openings c^1. The reinforcing of the bottom of the tire by the canvas strip, which may be formed into the rubber, is desirable, as it has a tendency to prevent the breaking of the rubber below that portion of the tire which is between the retaining wires and the rim. At the same time, by having the canvas strip wholly within the rim, all danger of stripping the edge of the canvas from the rubber, which would eventually result in a fracture of the rubber to the opening c^1, is prevented.

"It has been found in practice that by the constructions above described I produce a rubber-tired wheel-rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market."

Others of the specified features of construction have a distinct purpose and accomplish desirable results in connection with the other co-operating structural characteristics, which purposes and results are not set forth in the specification of the Grant patent, but are plainly inherent in the construction and arrangement of the parts therein shown and specified. The purpose and effect of these features may be explained as follows:

Under the conditions in which rubber tired vehicle wheels are used, they are liable at any time to be subjected to violent transverse strains, as when a wheel slews, or, for example, crosses a car track at a rather acute angle, and such strain tends to tear away the rubber or to dislodge it from the wheel rim, and if the strain were entirely concentrated at the point of application, it would be liable to tear away the rubber from its fastenings, or to dislodge it from the wheel rim so that the rubber, even though untorn, might

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come off of the wheel, or might fail to reseat properly in the channel, and thus be subjected to excessive wear by reason of its improper position relative to the channel.

The arrangement of the fastening wires shown in the Grant patent provides an elastic cushion of rubber between each wire and the bottom of the channel in the rim, and any strain tending to lift the tire, or to tip it laterally in the rim, is resisted by the fastening wire at that point, while the fastening wire itself is yielding on the cushion of rubber between it and the bottom of the channel extending entirely around the wheel. Therefore, the strain instead of being resisted by an unyielding fastening, meets a yielding resistance and is distributed so that the point at which the strain is directly applied does not have the entire strain concentrated upon it, and is not liable to tear or break away from the fastening as it would be if such yielding action were not provided for the fastening itself.

By having the fastening wires independent of one another, one of them may yield to relieve the strain at that point, when, as is usually the case, there is a tendency of one side of the rubber to rise from the bottom of the channel, while the other side remains at the bottom of the channel. Thus, the fastening which is principally subjected to the strain may yield to distribute that strain, while the other fastening remains unaffected and tends to prevent the complete dislodgment of the tire from the rim.

The outwardly flaring form of the channel and corresponding form of the unexposed portion of rubber seated therein, admits of such yielding side rocking of the rubber or the rise of one side slightly from the bottom of the channel, as is necessary to relieve the strain at that point, and then admits of and facilitates the reseating of the rubber, or its return to a normal position in the bottom of the channel, as soon as the dislodging strain has ceased to act.

The several components and the structural characteristics of the said components above explained by me are referred to in the claims of the Grant patent, and without quoting the said claims in the record, the elements and characteristics may be listed as follows, referring to structural elements by number and to the characteristics or specified features of said elements by letters. In claim 1, they are:

1. The metallic rim:

(*a*) Said rim having angularly projecting flanges; i. e., outwardly-flaring flanges.

2. The rubber tire:

(*b*) The inner portion of which is adapted to fit in the groove or channel of the rim.

(*c*) The outer portion of which has sides at an angle to the inner portion.

(*d*) The angle or corner between the outer and inner portions being located within the outer periphery of the flanges of the rim.

3. The independent retaining wires:

(*e*) Which pass entirely through the inner portion of the tire.

(*f*) And are also within the outer periphery of the flanges of the rim.

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Claim 2 refers to substantially the same elements and structural characteristics and in addition thereto:

4. A reinforcing strip of fibrous material:

(*g*) Placed at the bottom of said tire.

(*h*) And wholly within the flanges of the rim.

Claim 2 differs from claim 1 in describing certain of said features. For example, instead of specifying that the wires are within the outer peripheries of the flanges, it specifies that the tire has "openings extending entirely through the unexposed portion of said tire" and that the wires are in said openings. This does not refer to any difference in the structure in the two claims, both of which clearly define the retaining wires as passing through holes in the inner or unexposed portion of the rubber within, or below the level of, the outer peripheries of the flanges of the metallic rim.

Complainants' counsel produces and offers in evidence a wheel equipped with a rubber tire bearing the name "Firestone Tire & Rubber Co., Akron, O." molded in the rubber, and the same is offered in evidence and marked Complainants' Exhibit No. 3, Defendant's Rubber Tired Wheel.

Q. 5. I call your attention to Complainants' Exhibit No. 3, Defendant's Rubber Tired Wheel, and ask you to examine the same and state what you find to be the structure embodied in this exhibit, and compare it with the structure set forth in the Grant patent referred to, and state how it compares with or differs from, in structure and operation, the said patent.

A. The wheel shown me, which I will call Defendant's Wheel, is a wheel equipped with a rubber tire essentially the same in construction and mode of operation as the tire shown and described in the Grant patent in all respects.

The said exhibit wheel has had portions of the rubber cut away to expose the fastening wires to view, and to show the form of the channel and portion of the rubber seated therein, but I, of course, consider the wheel as if the rubber were complete instead of being mutilated for the purpose of showing the internal construction.

It is clear from inspection that defendant's wheel tire embodies all of the structural characteristics that are shown and described in the Grant patent and referred to in the claims thereof, and that they operate in the same way for the same purpose and with the same result.

To compare the defendant's tire specifically with the construction shown in the Grant patent and specified in the claim 1 thereof, said defendant's tire is composed of three principal elements, namely, first, the metallic rim in the form of a channel with outwardly flaring sides, i. e., as specified in claim 1 of the Grant patent, "a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides." The second component of defendant's tire is the rubber tire proper of essentially the same shape and relation to the channel of the rim as shown and described in the Grant patent, i. e., as specified in claim 1 of said patent, "a rubber tire, the inner portion of which is adapted to fit in said

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groove or channel, and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges," and the said rubber also has the longitudinal openings for the wires extending entirely through the length of the inner or unexposed portion of the rubber. The third component of defendant's tire is the independent retaining wires which are passed through the openings in the rubber and have their ends drawn together and united so as to form ties imbedded in the rubber and entirely encircling the rim within the channel thereof, i. e., as specified in claim 1, this component of defendant's tire is "independent retaining wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges," i. e., the flanges of the channel rim.

Defendant's tire also contains the additional feature referred to in claim 2 of the Grant patent, namely, "a reinforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges."

The only point in which defendant's tire does not appear to be an exact copy of the construction shown in the drawing of the Grant patent is that the sides of the outer or exposed portion of the tire are slightly concave instead of being straight, as shown in the drawing of the Grant patent to the point where they emerge into the curve or convexity forming the extreme outer portion of the tire. This difference is scarcely noticeable even as a matter of appearance, and in my opinion, is entirely immaterial so far as the structural and operative relations of the parts are concerned, in which structural and operative relations I regard defendant's tire as practically identical with the tire shown and described in the Grant patent, and referred to in the claims thereof in all respects.

Recess.

After Recess.

Q. 6. Assuming the construction to be such as shown in the Grant patent, is it your opinion that the qualities which you have termed "inherent qualities of the tire" would be destroyed by an abnormal tightening of the wires?

The question is objected to for the reason that the witness has not stated, and it has not been shown, what is an abnormal tightening of the wires.

A. It is my opinion that the wires cannot be tightened so excessively as to compare the action described by me as resulting from the relation of the wires to the rubber and rim.

With the usual proportions such as are indicated in the Grant patent and such as would naturally be followed by a competent constructor, the tensile strength of wire of a good quality of steel such as would naturally be used is not sufficient to admit of the wires being so tightened that they would not yield by reason of the cushion of rubber between them and the bottom of the channel to an outward strain tending to dislodge the rubber from the rim sufficiently

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to distribute the said strain or prevent its concentration upon the fastener at the point where the strain is applied.

Q. 7. In the side movement of the tire in resisting severe strains that you have referred to as an inherent quality of the Grant construction, would the action which permits of the slight raising of the wire on one side have any greater tendency to tear the rubber if the wires were abnormally or excessively tight?

Defendant's counsel objects to this question as irrelevant and immaterial, because the patent in suit contains no statement of the difficulty or problem suggested by the question and no means whereby any such difficulty, if it exists, is overcome, and the question is therefore irrelevant and immaterial.

A. The action which permits of the slight rising of the wire by reason of the yielding of the rubber between the wire and the bottom of the channel tends to relieve the rubber of tearing strain at the point where the strain tending to raise the rubber from the channel is applied, and this, I believe, is true when the wires are strained as tight as their tensile strength would warrant. It is in accordance with general mechanical practice when a tie or fastening of this general character is used not to strain the tie close to its breaking point, as that would render it liable to break in the operation of applying it, or in its subsequent use when applied. With the wires strained as tight as their tensile strength would warrant a skilled mechanic in straining them, they would when applied as shown in the Grant patent hold the rubber yieldingly and have tendency to diminish the tearing strain upon the rubber by reason of their capacity for yielding to the strain.

Q. 8. From your experience and observation of these tires and the study of the construction shown in the patent, is it your opinion, that within the limits of safety employed in the practical use of material such as set forth in this patent, it is practical to exhaust the capacity of the rubber to yield under the *the* wire to effect this compensating or side-tipping movement you have referred to?

A. It is my opinion and belief, based upon observation of these tires and of the operation of applying the same, that it is not possible to exhaust the yielding capacity of the rubber cushion afforded between the wire and the bottom of the channel with any strain that can be put upon the wire up to the full limit of the tensile strength.

Direct examination closed.

Cross-examination by Mr. LINTHICUM:

X Q. 9. In what cases have you testified relating to rubber tires for vehicle wheels?

A. I don't recall the titles of all the cases, but I have testified in several in which the Grant patent was involved, and I believe in all the cases in which the Grant patent has been sued upon.

I do not recall with certainty having testified in any other case relating to a rubber tire for vehicle wheels, but I have testified in some relating to pneumatic tires.

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X Q. 10. You were the Joseph P. Livermore who testified as the expert for complainant in the suit of Rubber Tire Wheel Co. vs. Columbia Pneumatic Wagon Wheel Co., in the Circuit Court of the United States for the Southern District of New York, decided by Judge Thomas, whose opinion is reported in 91 Federal Reporter, 978; also in the case of Rubber Tire Wheel Company vs. Goodyear Tire and Rubber Company, et al., brought in the Circuit Court of the United States, for the Northern District of Ohio, and in which the decision of the Court of Appeals of the Sixth Circuit is reported in 116 Federal Reporter, at page 363?

A. Yes.

X Q. 11. You are, of course, familiar with the prior art as disclosed in the records in those cases, and testified in those cases with such knowledge, and have given your testimony in this case, so far, in the light of such knowledge?

A. I was, of course, familiar with the prior art at the time when I testified in those cases, and my testimony was largely directed to a comparison of the Grant structure with the contrivance represented in the prior art.

Of course my testimony in the present case is given in the light of my previous knowledge of the prior art in the sense that I have not wholly divested myself of such knowledge, although I have not recently studied it in detail, and have had no occasion to take it into consideration especially in the present case, as up to the present I have only been called upon to explain the construction shown and described in the Grant patent without reference to other constructions which may have been devised previously with the same general end in view.

X Q. 12. I assume that you have carefully read and attentively considered the opinion of Judge Thomas in the Columbia case and of the Circuit Court of Appeals for the Sixth Circuit, in the Goodyear case. Is that so?

A. I have read those opinions, and have considered them with some care.

X Q. 13. And you understand, and are able to state the ground on which the Court in the former case sustained the Grant patent as a good and valid patent, and also the ground on which the Court in the latter case held that the Grant patent was invalid?

A. I think I understand in a general way the ground or grounds on which these decisions were based, but I doubt if I could make a complete or acceptable statement of the grounds for the different decisions excepting in the most general terms.

X Q. 14. Would it be a fair general statement to say that the Court in the Columbia case sustained the Grant patent on the theory that the construction and combination of parts permitted the tire to yield to laterally applied strain without cutting the wire or tilting out of the channel, while the Court in the Goodyear, or Ohio case held that no such function or effect was suggested in the Grant patent, and that the patentee gave no directions in his patent as to the manner in which the parts should be constructed, arranged and applied to secure such result or function?

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Question objected to as incompetent; the opinions show for themselves on what grounds they were based.

A. As I recall the decisions it does not seem to me that the question presents a substance of the two opinions.

I should say, however, that it does present at least one salient point, wherein the courts took different views of the subject.

My understanding of the matter is that Judge Thomas took the view that the yielding action of the fastening was a new and useful mode of operation, and that it was of some weight in leading to his conclusion that the Grant construction was a new and useful construction, not substantially anticipated by anything in the prior art.

I consider that the opinion in the Ohio case was based in part at least upon the finding that this action was not suggested in the Grant patent, and that the patentee gave no directions in his patent as to the manner in which the parts should be applied, in order to obtain the benefit of such action.

X Q. 15. Having had the benefit of a somewhat intimate knowledge of the prior art, and evidently from your last answer a very comprehensive knowledge of the decisions of the courts in those two cases; and I should judge a somewhat intimate knowledge of the construction, operation and advantages of the Grant tire, will you be good enough to state your own view of patentee Grant's achievement, or, in other words, state what you consider to be the vital and distinguishing characteristic of the Grant patent as set forth in the claims of that patent?

A. My own view of Grant's achievement is that he devised or discovered a structure of simple form in which all of the elements are so harmonized with one another as to make a far more effective rubber tire than any that had been previously devised, and one which was so effective in the matter of permanence and durability as to lead to the very extensive adoption of rubber tires in actual service, as distinguished from their being a rather rare and costly luxurious appendage, having only a very limited field of use.

The nature of the construction and of the achievement made by Grant in the art is such that I do not consider any one characteristic apart from the others, or any one elementary component as being distinctive of Grant's construction. The merit lies in the conjoint and co-related use of all the specific features which were described by me at length in my direct, and which are specified in claim 1 of the Grant patent.

X Q. 16. Referring to the structural elements tabulated by you in your direct examination, viz: 1. The metallic rim; 2. the rubber tire; 3. The independent retaining wires, and without reference to their specific characteristics which you referred to by letters, is it your understanding that the Grant patent was the first to disclose said elements singly or in combination?

A. It is not my understanding that he was the first to disclose the said elements individually, or to disclose the combination containing elements, each of which, individually considered, might be

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regarded as corresponding to the said elements of the Grant structure, if the characteristics specified are ignored.

X Q. 17. What are the specified features of construction having a distinct purpose and accomplishing desirable results in connection with the other co-operating structural characteristic which purposes and results are not set forth in the specification of the Grant patent?

A. The flaring form of the channel and the corresponding form of the unexposed part of the rubber in connection with this specific fastening device admits of an outward movement of the rubber, or a part of it when necessary, and the proper reseating of the rubber in the channel when the strain is removed. The independence of the retaining wires of one another, permits each fastening to yield when subjected to strain, without affecting the other retaining wire, which is not called upon to yield by the strain in question. The arrangement of the retaining wires in the body of the rubber as endless bands affords a yielding cushion between the wire and the bottom of the channel, all the way around the wheel, and therefore affords a yielding capacity for the wire when the rubber is subjected to a strain tending to lift it or a part of it out from the channel. The independence of the wires from connection with the channel relieves the fastening of strain which might be brought to bear on a connection between the wires and the channel or wheel rim, if such connection were used, due to slight creeping or longitudinal travel of the rubber in the rim. The arrangement of the wires in the unexposed part of the rubber below the flanges of the channel prevents liability of the fastening jumping over the flange of the channel and releasing the tire from the rim.

The above are all of the purposes and results that now occur to me which are not specified in the patent, but which accrue from the features of construction that are specified in the patent.

X Q. 18. The quality to yield to strain and to regain original form is inherent in that quality of rubber used in rubber tires, is it not?

A. Yes.

X Q. 19. Can you conceive how it would be possible to secure a rubber tire in a channeled rim by an endless retaining device passing through the tire, which would not have the cushioning effect of the interposed rubber between the wire and the bottom of the channel, which would allow the tire to yield to excessive strain and regain its normal position, or seat itself when the strain was relieved?

A. I do not see how it could be possible to use an endless retaining device in the body of the rubber and not obtain a cushion effect from the rubber between the retaining device and rim. The construction of the other parts, however, might be such as to impair the yielding action, or to prevent the reseating of the rubber if it should have yielded and become displaced on the original normal position.

X Q. 20. And since a metal channel having outwardly flaring flanges associated with a rubber tire, held in place within the channel by endless wires passing through the body of the rubber, antedated Grant's invention, the inherent yielding and reseating quality must

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either have been known prior to Grant's invention, or else it must have been developed by some other peculiarity of his construction or arrangement of parts. If the premise of my proposition is not correct, will you please correct me, and if it is correct, will you explain what peculiarity of construction or arrangement of parts brought out this capacity which you say is inherent in the Grant structure, but not described in the specification?

A. Under the assumption made in the question the property must have existed prior to Grant's invention, whether its existence was recognized or not. I do not see anything else in the Grant structure than the arrangement of the fastening wires and the flaring form of the channel and rubber which gives this capacity, and if tires had previously existed having this arrangement of the fastening wires, and this flaring shape to the channel, they undoubtedly had the property of capacity for yielding and reseating.

X Q. 21. As a matter of fact the flaring form of channel and the corresponding sided rubber tire are disclosed in combination in the older art prior to Grant's patent?

A. That is my recollection.

X Q. 22. Do you regard the degree of elasticity of the rubber used and the tension of the retaining wire employed to hold the rubber in place as material?

A. Not as a practical matter. The rubber should be of good quality for the purpose, and the fastening wires should be drawn as tight as is practicable without approaching too closely the ultimate strength of the wire.

X Q. 23. And the patent gives no direction as to these matters, is that correct?

A. Yes.

X Q. 24. Can you state any more definitely than you have done the proper degree of elasticity of the rubber, or the tension of the wires to secure the beneficial results of the Grant patent?

A. No, it seems to me obvious that the best results would be obtained by using the best quality of rubber obtainable for the purpose, and by fastening the wires as tight as the strength of the material will warrant.

JOSEPH P. LIVERMORE.

Joseph P. Livermore was examined as a witness on behalf of complainants in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

And thereupon JOSEPH P. LIVERMORE, a witness produced on behalf of complainants, having heretofore been duly sworn, deposes and says as follows:

Q. 1. Are you the same Joseph P. Livermore who testified previously in the above entitled cause?

A. I am.

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Q. 2. Have you read the testimony of Mr. R. H. Wiles, expert for defendant, and are you familiar with the state of the art as set forth by defendant's expert and as illustrated by defendant's evidence and exhibits in this cause?

A. Yes.

Q. 3. Please consider the various structures of the prior art, comparing the structure set forth in the Grant patent with them, and state whether or not in your opinion the structure shown and described in the patent in suit and referred to in the claims thereof is embodied in or anticipated by the structures of the prior art, giving your reasons for any opinions you may express.

A. I am decidedly of opinion that none of the structures of the prior art embodies the construction shown and described in the Grant patent and referred to in the claims thereof, and that all of the structures of the prior art collectively considered do not disclose nor suggest in any way the construction forming the subject of the Grant patent here sued upon.

It is important to observe that the Grant patent shows and describes a single unitary structure, namely, a wheel tire, made of several components, each having definite specified characteristics, and there being no latitude suggested as to variations from these characteristics, all of which are essential for giving the whole structure, namely the tire, its properties of reliability and durability and its superiority over all of the prior art structures as a rubber tire for general use on carriages and wagons.

Not only is it the fact that no latitude is indicated or suggested for variation from the specified characteristics and relations of the elements or components of the tire in the Grant patent, but I believe it also to be the fact that no such variation can be made in the actual tires without serious impairment of their utility, as will be recognized from mechanical considerations when changes in some one or more of the individual characteristics or relations are assumed to be made, and as is strongly indicated by the fact that defendants in this case and other manufacturers of rubber tires since the time when the Grant tire was put into general use, have copied the Grant tire in all of the features or characteristics of the individual elements and of their relations to one another shown and described in the Grant patent, and recited in the claims thereof, instead of adopting or substituting therefor some one or more of the characteristics or relations exhibited in structures of the prior art, as might equally well be done if the views of their expert in this case and of the experts on behalf of defendants in the other cases referred to by Mr. Wiles, were correct.

It is the fact, and as I understand it is not questioned by Mr. Wiles nor the defendant's experts in any of the prior suits for infringement of the Grant patent, that there is no example in the prior art, and no suggestion in any of the descriptions or specifications of the patents of the prior art, of a tire structure having components with the characteristics and relations set forth in the Grant patent and recited in the claims thereof, the position of Mr. Wiles and other experts referred to being, as I understand their testimony,

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that the specified characteristics, individually considered, were found in other relations in prior art structures and that no invention was required to bring them all together in the proper co-operative relation to one another in a single structure, or in other words, to produce the Grant tire by judicious selections from the information afforded in the prior art of the best construction for each individual element and the best relation of each element to the others, thus producing a tire having the sum of all of the virtues which had been previously scattered among various different tires, each of which must be conceded to be decidedly inferior to the tire of the Grant patent, as is evidenced by the supplanting of prior tires by the Grant tire and the extensive copying of the Grant tire after its merits became known.

As a corollary to or other aspect of this proposition I understand it also to be the view of Mr. Wiles and of the other experts who have appeared on behalf of defendant in suits brought upon the Grant patent, that the Grant tire contains nothing but the sum of the effects of the individual features or characteristics found scattered in the prior art structures, or in other words, that there is no new co-operative relationship or conjoint effect due to the new organization of these features into a single structure, but that each element and each specified characteristic of an element accomplishes no more and no less in the Grant tire than the said element or specified characteristic did in the different relation to other elements of the structure in which it was found in the prior art.

I am decidedly of opinion that such is not the case but that, on the other hand, in the Grant tire the organization is such that each element or characteristic contributes to the effectiveness of the others, while in the prior art structure the corresponding element or characteristic was not aided by, but, in some cases at least, was impaired in its effectiveness by misassociation with the other elements, and it seems clear that the Grant tire was produced, not as the result of the selection of a number of individual features or characteristics, each chosen with a view to obtaining the best form of that element or feature considered individually, but with a view to the co-active relationship of each to the others to produce a harmonious organization wherein no element effective in itself, had its effectiveness impaired by faulty association with other elements, but rather had its effectiveness enhanced by the proper construction of each other element to perform not only its individual or separable function, but to contribute its share to the working of the whole organization, which is thus decidedly superior to any that has been before devised for a like purpose.

On this point I may add that while defendant's expert regards it as within the realm of mechanical skill and judgment to select and correlate the characteristics and relations which would result in the production of the Grant tire, it seems obvious from his testimony that he would not have been led to, or succeeded in, selecting and organizing together the said features since he understands that there is no co-operative relationship involved in the organization shown and described in the Grant tire, but that it involves merely a selection

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of the best form of each element individually considered, and in accordance with his testimony his method would be, if he had desired to improve upon the structures in existence at the time of the Grant patent, to test each element individually and find the best form of construction for that individual element. Obviously with this method of selection he would not have been likely to hit upon Grant's pair of endless retaining wires as the fastening device, since considered merely as a fastening device in the relations in which such fastening devices were used in the prior art structures, they would be no better than and probably inferior to some of the other fastening devices—for example, the flat tape or band secured to the wheel felly as in the Elliott patent—among those of the prior art referred to by him in his deposition. Similarly there would be no likelihood of his hitting upon the Grant form of rim or channel iron shown in the Willoughby patent, No. 18,030, of 1892, among those referred to by him, rather than the form shown in the Greene patent with the flanges at right angles to the base, or others since regarded merely as a rim to hold the rubber without reference to the nature of the fastening device to be employed, the rim with outwardly flaring sides would be no better than and probably not so good as the rim with parallel sides as shown in the Greene patent, or the rim with only slightly flaring sides as shown in the Elliott patent, or the rim with converging sides as shown in the Willoughby patent, No. 5,924, of 1892, which latter was, as I understand, generally recognized as the best and was most commonly adopted in the rubber tire wheels that had come into actual use prior to the time of the Grant patent. Similarly there would be no reason for his choosing the converging form of the outer or exposed portion of the rubber shown in the Kearsley British patent No. 4,352, of 1883, or that shown in Fig. 6 of the Owen patent No. 365,091, rather than some of the other forms which he classes in the same category as for providing against the cutting of the rubber by the rim.

Nothing seems more certain to me from a study of the prior art structures and of the testimony of Mr. Wiles and other experts relating thereto, than that the structure shown and described in the Grant patent would *not* be produced merely by selecting the best form of each element when considered individually or without reference to its harmonious action with all of the other elements rather than to the mere performance of its individual function. It seems to me inconceivable that if the production of the Grant tire involved only the selection of the best form of each of its elements or components individually considered, it should not have been hit upon long prior to the time of the Grant patent, in view of the fact that inventors and mechanics were endeavoring for a period of at least twenty-five years prior to the time of the Grant patent to produce a satisfactory, that is reliable and durable, rubber tire for road vehicles. In the light of the selections made by these prior inventors it would appear that the mere finding out of which was the best of the several known forms of each element involved more than mechanical skill and had eluded even the inventive genius devoted to the subject, up to the time of the Grant patent, if it be the fact that

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judicious selection on that basis is all that is involved in the production of the Grant tire, which, in my opinion, is not the case.

Mr. Wiles, in his deposition, considered twenty patents as representing the prior art, which warranted his conclusion that the structure of the Grant patent involved only the selection and grouping together of old features and presented no invention or novelty whatever, but in the prior cases on the Grant tire, the records of which I understand are in evidence in the present case, a large number of additional patents were in evidence and many of them were discussed by the experts on behalf of defendants in those cases. There is, in my opinion, nothing in the additional patents not discussed by Mr. Wiles in this case, having any additional bearing upon the subject matter involved in this case, and I will therefore, for the most part, consider only the patents referred to by Mr. Wiles in making the detailed comparison of the structures therein shown with the construction forming the subject of the Grant patent sued upon. I have, however, prepared a chart containing the principal figures relied upon by the defendants in all of the cases thus far tried for infringement of the Grant patent, including those relied upon by Mr. Wiles in the present case, in which chart the prior art structures are grouped or classified in accordance with the nature of the means employed for fastening the rubber to the wheel rim.

As appears from the variety of the prior art structures, numerous and various expedients were devised prior to the time of the Grant patent in an attempt to provide a successful rubber tire for carriages and wagons, the effort being directed mainly to the attainment of a secure fastening for holding the rubber to the rim or felly of the wheel and preventing the rapid destruction of the rubber by the cutting or abrasion incident to its use upon the road. All of the prior devices were more or less deficient, and especially in respect to the means for fastening the rubber to the wheel and it is obvious that if there is any considerable liability of the rubber becoming detached in ordinary use, the inconvenience and damage resulting from the tire coming off while in use on the road, would largely counteract the benefit derived from its use while the rubber remained in place, so that until some construction attaining a reliable fastening of the tire to the rim was produced, rubber tires were not generally or extensively adopted for use on ordinary road vehicles.

The structures of the prior art may be conveniently grouped into three classes characterized by the means for, or method of, securing the rubber to the wheel rim, which is generally of channel-shape and receives a portion of the rubber tire proper within it, while the remainder of the rubber projects radially beyond the channel-iron or rim and affords the yielding cushion or support for the wheel.

These classes are, first, that in which the rubber is secured in the rim by cement or something of that nature, including what I will call cemented-in tires; second, those generally known as of the clincher type, in which the rubber is retained in the channel-shaped rim by reason of some dovetail or interlocking form of the engaging parts of the rubber and rim, no additional or third fastening element being required; and third, those in which some mechanical

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fastening device, additional to the rubber and rim themselves, is employed for fastening the rubber to the rim.

The tire of the Grant patent belongs to the third class and there is nothing in any of the structures pertaining to the first two classes which contains any suggestion of the complete organization of the tire forming the subject of the Grant patent, or of said tire as a unitary structure, but the structures of the first two classes, if pertinent at all, merely show some one or more of the individual features or characteristics which pertain to some of the elements of the tire forming the subject of the patent sued upon.

It should be noted furthermore, that there are one or two prior art structures which do not, strictly speaking, come within any of the three above named classes, namely, that of patent to Kelley No. 321,819, and that of the patent to Latta, No. 341,811, as I will explain when I take up these structures individually; and also that some of the prior art structures would be included in two of the above defined groups or classes, as, for example, the structure of Willoughby patent No. 5,924, of 1892, wherein the tire is of the clincher type but has an additional mechanical fastening, thus bringing it within the third class, and some which include, in addition to the clincher fastening, or a mechanical fastening, the use of cement, as in the first class, as an additional means for holding the rubber in the rim.

Referring first to the tires of the cemented-in class, it is obvious that they are totally deficient of one of the substantive elements of the Grant tire, namely, the mechanical fastening device or independent retaining wire, and furthermore that this difference involves an essential difference in the relation of the rubber and rim, and I am unable to see that any of the prior art structures pertaining to this first class, afford any suggestion whatever leading to the production of the tire forming the subject of the Grant patent, other than the generally recognized fact which led to all the activity in this art, that the elastic support afforded by rubber would be a good thing for wheel tires if a practical way of applying the rubber to and retaining it on the wheel could be devised.

Practically all of the structures pertaining to the first class were devised for use upon bicycle wheels, and cemented-in rubber tires were practical and satisfactory for bicycle wheels, where there is comparatively little lateral strain or pressure upon the tire at the point of contact with the ground tending to pull or roll the tire out from the rim. With carriages, on the other hand, the tire is frequently subjected to severe lateral pressure at the point of contact with the ground, which would pull the rubber out from the channel rim, unless some more effective means than cement were employed to hold it in place, and so far as I know cemented-in tires, such as were used upon bicycle wheels, have never been adopted for carriage wheels and they would, in my opinion, be entirely inadequate and practically worthless for such use.

With reference to cement as a means for fastening a rubber tire in a metal channel or wheel rim, it is to be observed that its use involves a permanent adhesive fit between the inner surface of the

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rim and the outer surface of the rubber secured thereto by the intervening film of cement, and that any tendency to pull or tear the rubber away from the rim must be borne and resisted entirely by the cement at the point subject to strain, the remainder of the fastening around the periphery of the wheel contributing in no way to the holding power at the point subject to strain. Unless, therefore, the cement at the point at any moment subject to strain is strong enough to withstand the strain, the rubber will be broken away from the rim at that point, and when the integrity of the cement is once broken at any point a comparatively small strain adjacent to the broken point will extend the held of rupture so that the tire will soon become loosened enough to roll out from the rim when a strain happens to fall on the point at which the cement has been previously broken.

Referring now to the tires of the second class, or of the clincher type, I understand that they were used, to some extent, for carriage wheels prior to the introduction of the Grant tires, and that they were probably the best rubber tire for that use up to the time of the Grant patent, although so far as my observation and information go they have been entirely supplanted by the tires such as are shown and described in the Grant patent. The clincher tires are subject to two serious defects which are practically entirely eliminated by the construction forming the subject of the Grant patent. These are: First, liability to detachment when in use as a sudden violent lateral pressure, such as is produced, for example, when the wheel slews or slips sidewise on the ground is liable to pull the rubber out from the rim in which the rubber is held only by its own elastic pressure, and if once pulled out from the rim at any point the rubber will not press back into the rim again but the line of detachment will easily be extended so that the tire, if once detached at any point, will soon come wholly off from the wheel. The second defect is that of cutting away the sides of the exposed part of the tire or cutting through from side to side of the exposed part of the tire by reason of pressure of the rubber against the edge of the channel rim, which requires to be in gripping contact with the sides of the rubber, as that is what holds the rubber in the channel. Certain expedients are suggested with a view of remedying or mitigating this evil which are referred to by Mr. Wiles and which I will consider in connection with the specific structures in which they were shown. It seems obvious from purely mechanical considerations that they would be entirely inadequate for the purpose for which they were devised, and so far as I know they were not adopted in the tires of this class that went into actual use and which were subject to the objectionable cutting action, which in some cases would completely sever the outer or exposed portion of the rubber from the part lying within the dovetail shaped channel, thus practically destroying the tire long before its period of durability, if not subjected to this cutting action, had elapsed.

Referring now to the structures of the third class wherein a mechanical fastening other than the rubber tire and channel-iron or rim is employed in combination with the rubber and rim, it is to be observed that the devising of the structures of this class indicates

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a recognition of the inadequacy of the means for securing the rubber in the rim employed in the first two classes, and that, for the most part, the structures in this third class, were contrived with a view to securing the rubber positively and immovably in the channel shaped rim. The prior art structures of this class were deficient for the most part either because they failed of their purpose of holding the rubber down in the rim, and it was liable to become dislodged and thrown off, the same as was the case with the cemented-in and clincher type of tires, or else because they held the rubber too positively and unyieldingly so that any strain tending to dislodge the rubber had to be borne wholly at the point at which the strain was applied, thus rendering the rubber itself liable to break or tear away from the fastening, this liability being in most cases enhanced by vicious relation between the rubber and rim, tending to cut or weaken the rubber by contact with the rim at the point where it was subjected to the strain tending to tear it away from the fastening.

Adjourned to Wednesday, December 6th, 1905, at 10:30 A. M.

NEW YORK, *December 6th*, 1905.

Met pursuant to adjournment.
Present: Counsel as before.

Direct examination of Mr. LIVERMORE—Continued.

(Answer continued.) Another fault generally exhibited in the prior art structures of the third class is that the form of the rim channel and of the portion of the rubber seated therein is such that if the rubber should be tipped sidewise from its normal position in the rim it would not naturally reseat itself or be crowded back to its proper place in the channel by pressure towards the channel, such as is produced when the part of the tire in question comes around to a bearing upon the ground again, and consequently if the fastening yields sufficiently to allow one side of the tire to rise from the bottom of the channel, the tire is liable to remain in tipped position and subject to excessive wear by reason of its improper relation to the rim channel, and road surface when it comes between the two.

In the Grant tire, on the other hand, the substantive elements rim, rubber, and fastening, are of such character and are so related to one another that while the rubber is securely held in rim-channel so that it is practically impossible to dislodge it, or throw any part of its length wholly out from the rim channel, it is nevertheless yieldingly held down to the bottom of the rim channel, and each side of the tire can yield to strain tending to pull it out from the rim channel independently of the other side, and the form of the rim channel and rubber seated therein is such as to admit of rising movement of either side of the rubber from the bottom of the channel, or a side tipping of the rubber in the channel, and also to admit of the free return of the rubber, or its reseating on the bottom of the channel, as soon as the strain tending to tip it in the channel ceases. Furthermore the form of the external portion of the rubber is such with relation to the rim and with relation to the specific

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fastening employed, as to render the portion of rubber between the rim and fastening that receives the principal tearing strain tending to break or tear the rubber away from the fastening, free from any additional weakening or cutting effect, such as was commonly present in the prior art structures of this class.

The result of the conjoint action of the correlated characteristics of the elements of the Grant tire is that the rubber is retained in the rim without danger of dislodgment and that the fastening, although adequate to prevent the possibility of dislodgment, is yielding, so that any strain tending to tear the rubber itself is cushioned and distributed instead of being concentrated all at the point of strain, and the portion of the rubber subjected to the pulling or tearing strain is not also subjected to cutting or wearing action, and consequently is not liable to break away or become torn from the fastening, and in short the defects or weaknesses that were inherent in all of the prior art structures of this class as well as in those of the clincher type or class and the cemented-in class, are absent from the Grant tire, and this too not by reason of any superiority in any of the elements or components individually considered with reference to the performance of its individual function, if that can be regarded as separable or segregable from the functions of the other element, but solely by reason of the operative relations of the elements to one another, and the specific characteristics of each, involved in its relation to the others, all of which characteristics and relations in substantially the identical specific form shown in the patent being, as I believe, essential for the production of this result as appears to me to be clearly demonstrated by the practical use of these tires, and experience with tires, wherein some of these characteristics or relations have been changed.

These elements and characteristics in the Grant tire as specified in claim 1, of the Grant patent, as pointed out in my former deposition are as follows:

1. The metallic rim:

(*a*) Said rim having angularly projecting flanges; i. e., outwardly-flaring flanges.

2. The rubber tire:

(*b*) The inner portion of which is adapted to fit in the groove or channel of the rim.

(*c*) The outer portion of which has sides at an angle to the inner portion.

(*d*) The angle or corner between the outer and inner portions being located within the outer periphery of the flanges of the rim.

3. The independent retaining wires:

(*e*) Which pass entirely through the inner portion of the tire.

(*f*) And are also within the outer periphery of the flanges of the rim.

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And Claim 2 refers to substantially the same elements and structural characteristics and in addition thereto:

4. A reinforcing strip of fibrous material:
   (*g*) Placed at the bottom of said tire.
   (*h*) And wholly within the flanges of the rim.

Referring now to the specific prior art constructions considered by Mr. Wiles in his deposition, I will take them up in the order in which they were discussed by Mr. Wiles, and compare them with the construction forming the subject of the Grant patent, having the elements, characteristics and relations above enumerated, and will state my views and my reasons for them where they differ from those of Mr. Wiles with reference to the pertinence of the prior art structures to the determination of the question of whether or not the construction forming the subject of the Grant patent was of substantial mechanical novelty, and especially when regarded as a unitary structure involving the co-action of all of its components and characteristics.

Greene Patent No. 169,100, *October* 26, 1875.

The Greene patent is for a rubber tire which may be included in the third class in the classification above made by me, being composed of a rim, the rubber, and a mechanical fastening for holding the rubber in the rim, and it is represented on the chart produced by me among the tires of this class.

Greene, No 169,100 of '75.

Fig 2.

No one of the three substantive elements of the tire of the Greene patent has the characteristics specified for and essential to the corresponding substantive elements of the Grant tire, and I do not understand that the Greene patent of itself is regarded by Mr. Wiles as anticipating the Grant invention, his view being, as I understand, that the Greene patent limited any subsequent invention in this class of tires to details of form and arrangement of the several individual components.

In other words, his view, as I understand it, is that the Greene patent discloses the combination of the three substantive elements found in all tires of this class, namely, rim, rubber and mechanical fastener for holding the rubber in the rim, and that thereafter there could be no new combination involving the three elements thus broadly considered, but only improvements in the individual elements without reference to the relations of all of said elements to one another in a unitary structure.

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Mr. Wiles, after pointing out that the tire of the Greene patent contained the combination of the three substantive elements, as I have called them, of the Grant tire, or "the fundamental combination of the Grant structure," as he calls it, made the following statement:

"This primary combination having been thus made matter of public knowledge, the only progress from the date of the Greene patent up to the time of the Grant application was merely as to matters of details of form and arrangement; and, in my judgment, these variations of detail had been so fully developed, when Grant entered the field with the application for the patent in suit, that the structure shown and described in that application involved no invention whatever."

I agree with the first clause of the above statement, namely, that the only progress from the date of Greene to the time of the Grant patent in the way of improving tires of this class consisted in details of form or arrangement of one or more of the elements individually considered, such for example, as improvements in the form of rim to diminish the cutting tendency of the edges of the flanges, or improvements in the form or character of the fastening with a view to rendering it stronger or more secure, and that with the exception of one or two structures, such as shown in the Welch patent and in the Timberlake patent, which I will take up next, there was no improvement in the organization or in the relations of the substantive elements to one another making up the unitary structure, from the Greene patent down to the time of the Grant patent.

I do not, however, agree with the latter part of Mr. Wiles' above quoted statement to the effect that the field for improvement had been exhausted when Grant entered the field. That may be true as to the individual elements, but the field was still open for the production of a new organization, and the Grant tire, was in my opinion, such a new organization, involving substantial novelty and very substantial improvement in the matter of the relation of the elements to one another, or in the structure as a whole, although individually considered, so far as the relation of each to the others may be ignored, or so far as each is capable of use in connection with other and specifically different forms of the elements with which it is associated in the Grant tire, said individual elements may exhibit and I believe do exhibit, no substantial improvement over the corresponding individual elements in the structures of the prior art.

Before leaving the Greene patent I will state that while superficially it appears to be an example of a tire of the third class, and so far as it has any relation to the subject matter of this case, it may be conceded to be an example of that class of tire, it appears to be based upon a somewhat different principle, namely, that which underlies the structures previously referred to by me as not coming within any of the classes thus far considered by me, but which constitute what I will now call a fourth class, characterized by having the tire held in place on rim by its own contractile elasticity, practically the same as an ordinary rubber band is held when stretched around a bundle of papers.

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It is obvious that the contractile elasticity of a rubber strip made normally smaller than the periphery of the wheel and stretched so as to encircle and clasp the wheel, is entirely inadequate for keeping the tire on the wheel under the conditions incident to use, and inventors who have dealt with tires operating upon this principle have commonly added some of the other provisions for fastening, as for example, cement, or as in the Greene patent under discussion, a gripping fit of the rubber in the channel and a tensile reinforce to the stretched rubber, such as the wire C shown in the Greene patent and referred to as "the metallic anti-stretcher embodied in the plastic rubber compound."

As showing that Greene in the patent under discussion contemplated a tire of the fourth class, or a stretched-on tire, as I will call it, I call attention to the statement that the invention is an improvement upon the mode of constructing and attaching rubber tires to wheels forming the subject of his prior patent No. 91,435, dated June 15, 1869.

One construction shown in this prior Greene patent is represented on the chart produced by me among the cemented-on tires. The said Greene patent shows that the rubber is stretched into place and is to be retained in place by its own elasticity, although in one of the forms shown the space in the rim channel contracts towards the top or outer part, so that the tire is additionally held by the grip of the rim on the rubber, as in the second or clincher class of tires.

The Greene patent No. 169,100 discussed by Mr. Wiles, states in substance that the tensile elasticity of rubber alone is insufficient to retain it in the rim when subjected to use on pavements and adds that

"This liability of getting off the wheel rendered the use of such rubber tires unsafe, and had, for that reason, to be abandoned until some means could be discovered which would maintain the tire in its place."

He then points out that his improvement consists in combining with or placing into the body of the rubber tire an endless band of wire, variously shaped—flat, round, or twisted—or chains or multiple stranded cables of wires, as a metallic anti-stretcher.

The wire shown is placed high up in the rubber and is intended merely to prevent longitudinal stretching of the rubber which may however be stretched enough in conjunction with the yielding of the rubber between the wire and the bottom of the channel to enable it to be put on to the wheel or channel in the form of an endless band, and it is liable to be thrown out from the channel by a violent lateral pressure on the portion of the tire projecting from the rim.

Furthermore, the form of the engaging surfaces of the rubber and rim is such that if one side of the rubber were started up from the bottom of the rim it would not naturally reseat itself under pressure towards the rim, but would remain in abnormal position subjecting it to excessive wear.

In connection with the Greene patent, Mr. Wiles referred to the fact that the Grant tire might be, and in some cases, has been applied to the wheel by first uniting the ends of the retaining wire

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and then stretching or jumping the tire over the flange of the rim into the channel thereof, as is the contemplated method of applying the tire of the Greene patent. While it is possible to apply the Grant tire in this manner by appliances devised for that purpose, there is no danger of the tire when once applied being thrown off, by reason of the employment of the two independent wires as the fastening device and by reason of the location of the fastening wires in the unexposed portion of the rubber below or within the outer periphery of the flanges of the rim. None of the strains incident to use tend to lift the rubber bodily out from the channel, but they tend to tip or roll it out and a single centrally located wire at or above the level of the outer edges of the rim flanges, as in the Greene patent, may be thus crowded or rolled over one of the flanges, while a like strain on the Grant tire would merely lift one side of the tire which would immediately reseat itself as soon as the strain at that point ceased to act.

Welch British Patent, No. 14563 *of* 1890.

This Welch patent was referred to, as I understand, principally as illustrating the use of two endless retaining wires extending circumferentially through the tire as the fastening device for holding the tire proper, or rubber, on the rim. In other words, it shows the fastening device of the Grant tire regarded as an individual element without considering the character of the associated elements and their relation to one another and to the fastening device.

Obviously there was no novelty in the third substantive element of the Grant tire, namely, the two independent retaining wires constituting the fastening device, and any advantage due to the employment of that specific fastening device in the Grant tire must therefore accrue from its novel co-operative relationship to the remaining elements of the structure.

The structure referred to in the Welch patent I have already mentioned as exhibiting a substantially different organization or unitary structural combination of the three substantive elements, rim, rubber and fastening, from that forming the subject of the Grant patent.

This tire structure of the Welch patent is suitable only for bicycles or light vehicles, and is characterized by having substantially all of the rubber exposed on the outside of the rim instead of having it composed of an inner unexposed portion seated in a channel shaped rim and laterally confined by the side flanges of the rim and of an outer exposed portion projecting from the channel of the rim.

It is made clear at the outset in the provisional specification that the very purpose of the Welch invention is to produce a substantially different tire structure from those in which the rubber is contained in part in a channel shaped rim, as appears from the following statement:

"Hitherto the majority of rubber tires used on cycle wheels have been round in section and of small diameter fitted in grooved rims or felloes which has not only rendered half of the rubber tire of

little or no use for reducing vibration but has also cut on the sharp edges of the rims or felloes, thus destroying the tire.

"According to this invention the rubber tires are soft and of larger form and are constructed to fit either wholly or partly outside the metal rims or felloes which may in some cases be of special shape as hereinafter described."

WELCH
BRITISH PATENT
No. 14,563/90

Fig 7

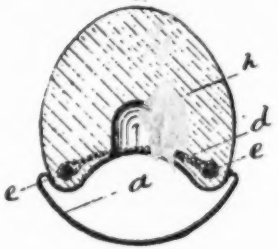
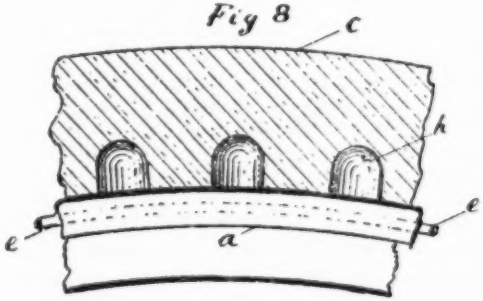


Fig 8



The fact that the structure is one in which the rubber is not confined laterally by the side flanges of a channel shaped rim, but was essentially distinguished from that type of structure is also indicated in the final specification, as follows:

"The above described rubber tires being either wholly or partly outside the metal rims or felloes are free to expand laterally thus giving a more elastic contact with the ground and therefore reducing vibration more effectually."

Obviously the tire shown and described in the Welch patent is totally different in construction and operative relations of its essential components from the tire of the Grant patent, and it affords no suggestion whatever leading towards the production of a tire of the character of that forming the subject of the Grant patent.

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Mr. Wiles' principal statement as to the significance of this Welch patent is as follows:

"In view of this Welch British patent, it would seem that at the time of the application for the Grant patent in suit there could have been no invention in providing a tire of any suitable cross-section with two endless retaining-wires intended and adapted to hold it in place in its seat on the rim of a wheel. Thus, for instance, it appears to me that in view of this Welch patent, there could have been no possible invention in providing the Green tire of patent No. 169,100 with two independent, endless retaining-wires, instead of the single, endless retaining-wire shown and described in said Greene patent as the means for holding the tire in its place. The use of two endless retaining-wires, instead of one, is one of the developments of the prior art subsequent to the Greene patent, and I should say there could be no possible invention involved in applying this publicly-known development of the art to the Greene tire, or to any other tire of any given cross-section, whether such tire had or had not been previously provided with two retaining-wires, or with any retaining-wire or retaining-strip of any kind whatever."

It may be conceded that so far as the fastening device is regarded as an individual element, there would be, in general, no novelty subsequent to the time of the Welch patent in substituting two endless retaining-wires for any other form of mechanical fastener for which such substitution might be made. It is to be observed, however, that if such substitution were made in the tire of the Greene patent, for example, as suggested by Mr. Wiles, the resulting structure would not be the Grant tire and would not be in any essential characteristic of operation any nearer the Grant tire than is the construction actually shown in the Greene patent.

What Grant did was not to substitute or use two endless retaining-wires in place of the single wire shown in the Greene patent, or in the place of the mechanical fastening in any form of tire known prior to the time of the Grant patent (as will appear when each prior structure is considered in turn) but to apply the said specific form of fastener in connection with specific forms of rim and rubber never before organized together in a tire structure, the advantage of this specific form of fastener employed by Grant depending entirely upon the co-action of the other elements, rim and rubber, in the specific forms shown in the Grant patent, and not upon any advantage, if there be any, in this form of fastener individually considered or when associated with other elements, rim and rubber, of substantially different charactertistic and operative relations to the fastening wires as is the case, for example, in the tire of the Welch patent.

Timberlake British Patent, No. 20706 *of* 1890.

This Timberlake patent shows another example of a structure of the same character as that forming the subject of the Welch patent just considered, namely, a cushion tire or one composed of a relatively large and in some cases, hollow, body of rubber tied or secured

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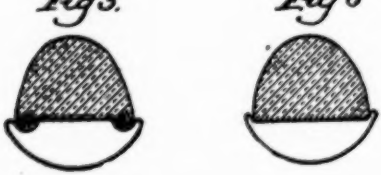
on the outside of the rim instead of being secured in the groove of a channel shaped rim.

This patent was referred to as showing (in Figs. 2, 3, 4, 5 and 9) another example of the employment of two separate or independent retaining-wires for holding the tire in place on the rim. Mr. Wiles also calls attention to the fact that "this Timberlake patent recognizes the danger of the cutting of the tire on the edges of the rim flange and provides a structural form intended and adapted to obviate the difficulty." Timberlake does so, however, practically by dispensing with a channel shaped rim and leaving the rubber wholly on the outside of the rim as is indicated by the claims of the Timberlake patent which are as follows:

"1. The combination with a concave rim of a flat or approximately flat outer plate and a cushion tire with similar flat side fixed thereon.

"2. The attachment of cushion tires to flat or nearly flat surfaced rims by means of canvas and lacing or wiring, substantially as described."

Timberlake No. 20,706, of '90.



Obviously the structure of the Timberlake patent has essentially the same relation to the tire of the Grant patent as does the structure of the Welch patent above considered, and what I said with reference to the Welch patent as compared with the tire of the Grant patent and other tire structures may be understood as applying to the construction of the Timberlake patent without repetition under this heading.

Rodgers Patent No. 539,826, *of May* 28, 1895.

The tire shown and described in the Rodgers patent is substantially different from the Grant tire and incapable of the mode of operation which characterizes the Grant tire and gives it important advantages over all prior tires.

Without describing all of the details of the various modifications of the tire structure as shown in the Rodgers patent it is to be observed that while the sides of the channel are very slightly flaring on their inner surfaces they are deep and in effect the same as if at right angles to the bottom of the channel, the form of the channel and rubber being such that there can be no yielding or tipping of the rubber and reseating, such as takes place in the Grant tire and contributes largely to the effectiveness thereof.

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Five different constructions or modifications are shown in the Rodgers patent, three of which (shown in Figs. 6, 7 and 8) show three different forms of "confining wires or metallic cores" as they are called, passed lengthwise through corresponding openings in the rubber.

Not only is the construction of the rim and rubber such that the rubber would not reseat itself after being raised or tipped sidewise from the bottom of the channel, but that no such tipping was contemplated is indicated by the following statement in the specification with reference to the part B of the tire which is seated in the rim:

"Where preferred, the part B may be fastened in the rim, by cementing it therein, in the usual manner, in which case the wires can be dispensed with, or both the wires and cement can be used, if desired, thereby insuring a firm union of the part B of the rubber tire or tread with the metallic rim."

Mr. Wiles says that this Rodgers patent is interesting primarily because it illustrates and describes the use of a single endless retaining wire, the alternative use of two independent endless retaining-wires, and the alternative use of an endless retaining-band "all these constructions being thus obviously made interchangeable equivalents of each other so far as the consideration of any matter of invention is concerned."

Rodgers, No. 539,826, of '95.

Fig. 6. Fig. 7. Fig. 8.

I concur in the above view so far as it applies to the wire, wires, or band, merely as a fastening device regardless of co-operative characteristics of the other elements. Mr. Wiles' statement that their interchangeable equivalents, so far as the consideration of *any* matter of invention is concerned, seems to me to indicate that he does not yet recognize that there is a very substantial difference between these fasteners when the co-operative relations of the other elments are taken into account, and that if he had undertaken the problem at the time when Grant did of devising a better rubber tire for carriages and wagons than any that had been up to that time produced, he would have been unable to hit upon any new structural and operative relation of the main elements, and would not have employed the two wires as a fastening device unless regarded merely as a fastening device for holding *any* form of rubber in *any* corresponding form of channel he found it to be better than a single wire or than a flat band or than any of the other forms of fastening devices which he might find at hand in the art, employed with any form of rim and rubber. On this basis, and using ordinary mechanical judgment he would, I think, select the single wire construction shown in Fig. 6

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of the Rodgers patent as the best of the three, since the form of the channel and rubber is such that the rubber probably would not roll out of the channel but would give way by tearing off of the narrow exposed part from the wider part contained in the channel, and the single central wire shown in Fig. 6 would weaken the rubber at the critical point much less than either the two-wire construction shown in Fig. 7, or the flat band construction shown in Fig. 8.

Mr. Wiles closes his discussion of the Rodgers patent by a summary of features contained therein, which in the terms used by him appears to correspond somewhat closely with the features set forth in the language of the Grant patent, and he concludes with the following statement:

"In view of the Rodgers patent alone, it is doubtful, in my mind, whether the tire of the Grant patent shows any invention whatever, but other patents of the prior art to which I am about to refer seem to me to demonstrate that in constructing the tire of the patent in suit Grant did nothing more than to avail himself of the discoveries of prior constructors, by selecting from different sources certain peculiarities of form and arrangement which appeared to him to be the most desirable."

With reference to the Rodgers patent I am unable to see that there is anything characteristic of the tire of the Rodgers patent (as distinguished from other tires) or which could be regarded as a discovery of Rodgers which Grant availed of, and there is practically nothing in the discoveries of prior constructors as disclosed by the various patents in evidence in this case that he did avail of, but on the other hand Grant's tire is differentiated from all others by a novel structural relation involving certain definite specified charactertistics of each of the substantive elements or components of the tire, which is nowhere foreshadowed in the prior structures which do not exhibit even any approach in that direction from the time of the earliest example of a tire of the general class comprising a rim, a rubber, and a mechanical fastener (say for example the tire of the Greene patent in 1875) down to the time of the Grant patent twenty years later.

Adjourned to Thursday, December 7th, 1905, at 10:30 A. M.

NEW YORK, *December 7th*, 1905.

Met pursuant to adjournment.
Present: Counsel as before.

Direct examination of Mr. LIVERMORE—Continued.

(Answer continued.)

Elliott Patents, Nos. 440,701 *and* 440,702, *November* 18, 1890.

In the Elliott patent No. 440,702 the rubber is contained in a channel shaped rim having only slightly flaring sides, and the exposed portion of the rubber outside of the rim is substantially wider than the part within the rim so that when compressed against the

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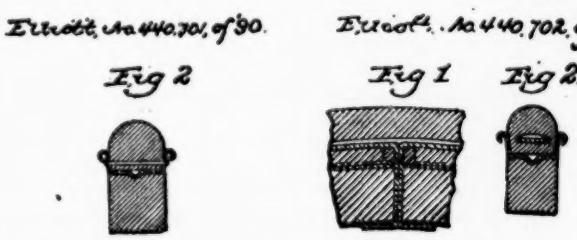
road surface it bulges out over the edges of the rim, as is recognized in said Elliott patent. The rubber is fastened in the channel of the rim by a flat metallic band passed through a corresponding longitudinal opening in the rubber and having its ends passed out through an opening in the tire and felly of the wheel and made fast to the inner periphery of the felly.

A fastening band of this kind is not an equivalent of two wires, because it serves the body of the rubber for the entire width of the fastening. If the rubber cuts through from one edge of the band to the outside, substantially the whole exposed part of the rubber is released, so that it quickly tears away from the other side, and such tearing action, if begun at any point, will quickly extend wholly around the tire. Moreover, the fastening of the band or tape to the felly is objectionable, as it confines the rubber and the fastening band or tape against lateral and longitudinal movement in the channel at this point to relieve excessive strain. When the rubber is rolled along the ground under heavy pressure, it is compressed at the point of contact, which tends to pile it up or expand it in advance, and at the rear, of the point of contact. This tends to cause the tire to creep or travel slightly along in the channel. This creeping tendency in the Elliott tire is resisted at the point where the ends of the fastening tape pass through the tire and felly and are fastened to the latter, so that the rubber tends to pile up or become excessively compressed



at this point, putting it under great strain, so that the rubber will break or tear away along the edges of the tape at this point after a comparatively short period of use. The above considerations apply to the fastening device of the Elliott patent considered individually; that is, without regard to any co-operative relation between it and the specific construction of the other elements, namely, the channel and rubber, which might be varied in accordance with various of the forms of these elements exhibited in the art without affecting the nature, mode of operation and effect of the fastening device in the matters above referred to. When, however, the co-operative relation between the fastening wires of the Grant patent and the specific form of rubber and rim co-operating therewith are taken into account a still more marked functional difference between the Grant structure and one having a fastening band like that of the Elliott patent is readily recognized. In the Elliott construction the fastening band is neither independent of the rim nor does it contain separate fastenings for the two sides of the rubber independent of one another,

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so that one may yield to relieve the tire when subjected to excessive strains while the other remains in place to hold the other side of the tire so that it will certainly reseat itself properly when the strain is removed. The Elliott band, being a single flat tape, cannot have one side rise without the other, and there was undoubtedly no conception of anything other than to hold both sides down in the channel at all times the same as was the case in substantially all rubber tires prior to the time of the Grant patent here sued upon.

With reference to the feature of the Elliott tire of having the fastening strip fastened to the felly at one point, Mr. Wiles makes the following statement:

"In my judgment, this is not a desirable construction, as compared with that in which the ends of the retaining-wire are directly joined to each other, so as to form an 'endless' annulus; but in view of the prior patents to which I have already referred, it seems impossible that any invention whatever could be involved in directly joining the ends of the flat band of the Elliott tire of patent No. 440,702, or in substituting for that band a single, endless retaining-wire, or a pair of endless retaining-wires. In other words, if for any reason the cross section of the rim and tire of either of these two Elliott patents is practically more desirable than the cross section of the rim and tire of the Welch British patent of 1890, or the rim and tire of the Timberlake British patent of 1890, or the rim and tire of the Rogers patent, No. 539,826, there is no reason why any constructor should not use the Elliott rim and tire in conjunction with a pair of independent, endless retaining-wires extending circumferentially through the tire; and such application of the old, independent, endless retaining-wires to the Elliott rim and tire could not possibly have involved any invention whatever, at the date of the application for the Grant patent in suit."

It may be added in comment upon the above assertion that such application of the old independent endless retaining-wires in the Elliott rim and tire would not have produced the Grant tire nor any substantial improvement upon the Elliott tire as actually shown, as the form of rim and rubber is such that the rubber must be held down in the bottom of the channel, and is also such that the rubber between the fastening and the edge of the channel flange is subjected to nipping pressure between the edge of the flange and the ground, and is liable to be cut by any sharp obstacle on the surface of the ground, thereby weakening it at the point where it is subjected to the strain tending to tear it away from the fastening.

Furthermore, it seems to me that it may be assumed that Elliott knew enough to use endless wires if there had been any utility in doing so in his structure, or if he had conceived that there could be any utility in using such fastening with other forms of the other elements, channel and rubber, capable of co-operating therewith, to produce a more reliable and durable tire than the one actually shown by him, as undoubtedly his purpose was to produce a better tire than those which had gone before, rather than an inferior one. In fact it appears that the very essence of his invention, or supposed advance in the art, consisted in discarding the endless band construction and adopting the construction devised by him characterized by having

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the ends of the band secured to the felly, and that he thought that the flat band was the best form of fastening and contemplated holding the rubber down in the channel without possibility of yielding, is indicated by the following excerpts from the specification of his patent:

"The two ends of the strip are thereafter drawn as tightly as possible, drawing the strip in the opening *e* taut and binding the rubber tire firmly in place."

* * * * * * *

"While I consider a flat strip the best to use, as it presents a wider bearing surface on the tire to hold down the edges and prevent it from rolling, yet the metallic block may be formed to accommodate a strip other than flat."

Obviously Grant in the production of his tire did not avail himself of any discovery made by Elliott, and no one could learn anything from this Elliott patent leading in any way towards the production of the Grant tire.

The other Elliott patent 440,701, shows a different form of fastening, even more remote from that characteristic of the Grant tire than the one just above considered, and I understand that this patent was referred to mainly on account of the fact that the outer edges of the channel flanges are rolled outward to form beads or rounding edges, which are not sharp and are not of themselves likely to cut the rubber.

Mr. Wiles calls attention especially to the following statement in the patent as showing that it furnishes another example (than that shown in the Welch and Timberlake patents, I suppose he means) of a provision for preventing the cutting of the tire on the edges of the rim flanges:

"By making the metallic tire in this manner the rubber tire, when compressed by a direct or lateral pressure, and thereby overlying the metallic edges b^1, will not be cut or injured by said edges, while said edges are made sufficiently high to properly reinforce the rubber tire."

This might answer if the travel were confined to smooth surfaces, such for example, as sheet asphalt pavement, but in general use the wheel would inevitably encounter more or less sharp projections which will cut into the rubber compressed out over the rounding edge of the rim, which in this case would constitute the cutting bed or anvil, rather than the cutting instrument. In the Grant construction on the other hand, the rubber is prevented from coming between the edges of the rim and the supporting road surface under the conditions incident to use.

Willoughby British Patent, No. 5,924, of 1892.

This patent shows in Fig. 8*a*, which is referred to especially by Mr. Wiles, a construction of tire and rim of the clincher type, the rubber being primarily held by the converging or dovetail shape of the rim-channel grasping the sides of the correspondingly shaped rubber, but being also provided with longitudinally elastic wire springs

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tending to hold the rubber down by their contractile elasticity, as is done by the elasticity of the rubber itself in the fourth or stretched-on class of tires before considered by me.

Willoughby No. 5924 of 1892.

FIG. 8a.

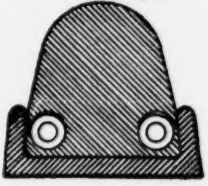
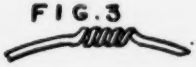


FIG. 3



This Willoughby patent shows substantially nothing in common with the construction forming the subject of the Grant patent, except the shape of the outer or exposed portion of the rubber which is of but comparatively small importance when unassociated with the characteristics of the other parts of the tire essential to the Grant structure.

With reference to this Willoughby tire, Mr. Wiles makes the following statement:

"It is surely apparent that in view of the various other patents of the prior art to which I have referred, there could have been no possible invention, at the time of the application for the Grant patent in suit, in substituting plain, endless retaining wires for the coil-comprising, retaining-wires shown and described in the British patent, No. 5,924, of 1892, now under consideration."

It is equally evident that the substitution suggested would amount to nothing of practical importance, and that Willoughby's improvement consisted largely, if not solely, in the employment of spring wires as distinguished from plain wires, which of course must have been known to him.

Grant certainly availed of no improvement or discovery of Willoughby disclosed in this patent in the production of his, Grant's tire, and the information derivable from the Willoughby patent does not lead at all in the direction of Grant's construction as compared with the early examples of tires of this general class comprising rim, rubber, and fastening, exemplified, for example, in the Greene patent of those referred to by Mr. Wiles.

Even such advantage as is attained in the Grant construction by the tapering form of the external or exposed portion of the rubber, is largely nullified in the Willoughby construction by the necessity of having the channel-flanges hug the rubber close along the sides of the exposed portion, which works back and forth with a kneading action against the edge of the rim, when compressed, by coming in contact with the ground.

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The Latta Patent, No. 341,811, *May* 11, 1886.

This patent shows in the sectional view, Fig. 5, a construction which in superficial appearance resembles the tire of the Grant patent more closely perhaps than any yet considered by me or than any in evidence in this case, and I understand it to be Mr. Wiles' view that the construction shown in the Latta patent comes nearer to that forming the subject of the Grant patent than any other single structure in the prior art (see his answer to xQ. 8).

LATTA U. S. PATENT NO. 341,811

Fig 1

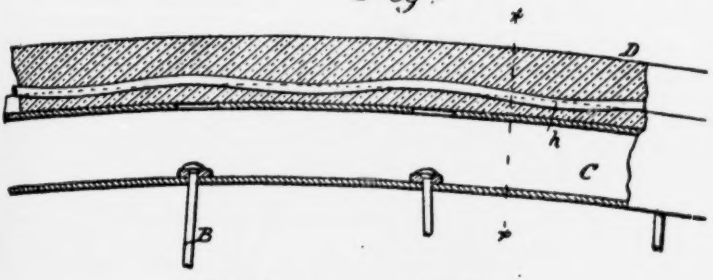
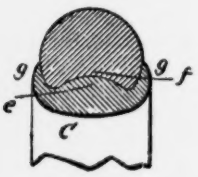


Fig 5

Fig 6



This tire of the Latta patent is really an example of the fourth or stretched-on class of tires, wherein wire springs in the rubber are employed to hold the rubber in place by their contractile force instead of the elasticity of the rubber itself.

While the spring character of the wires does not appear in the sectional view (Fig. 5) taken by Mr. Wiles as illustrative of the Latta structure, it is clearly shown in Fig. 1 of the drawing and is pointed out as a feature of the invention in claims 6 and 7, which are the only ones relating to the tire construction, and is described in the specification as follows:

"*h* represents spring wires which are embedded in the rubber tire. These wires are crimped or bent into a serpentine form, as represented in Figure 1, which permits the wires to stretch sufficiently to permit the tire to be placed into the seat of the rim and to contract after the tire has been inserted in its seat, and thus secure the tire in its seat. These wires prevent the tire from rolling out of the seat when the wheel is in use, and if one of the wires should break, the

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others will, of course, retain the tire in place. The two ends of each wire are preferably secured before the tire is moulded, so that each wire constitutes a complete ring, and the rubber tire is preferably moulded in an endless ring of the proper size to fit the wheel. The wavy or serpentine form of the wires prevents them from drawing in the tire if broken therein, so that if the wires should break at several different points they would not permit the tire to become detached from the wheel."

The claims relating to the Latta tire construction are as follows:

"6. An elastic tire having a wavy or serpentine spring-wire molded into the tire, substantially as set forth.

"7. The combination, with the rim having a recessed seat for the tire, of an elastic tire having a serpentine spring-wire molded into the tire, substantially as set forth."

It seems to me clear beyond dispute that these elastic or serpentine spring wires of the Latta tire are not the equivalent of the independent retaining wires which are an element of the Grant tire, aside from the substantial differences between the other components of the Latta tire and the other components of the Grant tire. Mr. Wiles, however, as I understand, is of the opinion that they are, and he makes some statements with reference to the mode of operation of the Latta tire as actually shown, which I do not agree with, and which I will take up later.

He also says in substance that Fig. 5 of the Latta patent would suggest the use of plain, as distinguished from crimped or serpentine, wires as the retaining means and adds:

"Wholly aside from the effect of figure 5 of the drawings (when taken by itself), I say, further, that the possibility of substituting plain wires for the sinuous wires, to form the endless retaining-wires of the Latta tire would naturally (and, it seems to me, inevitably) suggest itself to any intelligent mechanic who might study the Latta patent; and it is perfectly apparent that in view of the other patents of the prior art to which I have referred, such substitution could involve no invention whatever."

It seems to me reasonable to assume that Latta himself must have known all this and would have used the plain wires as distinguished from the serpentine ones in his tire, if that had been the whole solution of the problem, as Mr. Wiles seems to assume. The very fact that Latta did not use them and devised the spring-wires instead, would lead one to the conclusion that plain wires were known by those skilled in this art to be inferior to the crimped spring wires, or certainly no better in the organizations in which they were used.

I myself believe it to be the fact that no substantial improvement would be produced by the employment of plain wires in the Latta tire, by reason of the non-co-operative character of the remaining elements, rim and rubber, which would preclude the action which is characteristic of the tire of the Grant patent and, I believe, gives it its advantage over all prior tire structures.

Referring to the co-action of the rim and rubber, Mr. Wiles makes the following statement:

"It will be seen that if any lateral pressure on either side of the

exposed portion of the tire should ever be sufficient to raise the corresponding retaining-wire from its normal position, the corresponding angle of the base of the tire could lift from its seat as the wire raised, and could drop back to its seat when the lateral pressure was removed."

And he adds that either with the three wire construction shown or with the central wire absent "the flange would offer no resistance to the rising or falling of that angle of the tire adjacent to it."

I do not think that this would be the case, but on the other hand am of opinion that the lobe shape of the sides of the tire, due to the convexing of the bottom of the channel, and the fit of the rubber against the inside of each flange clear to the top, would result in a jamming of the rubber if either side were pulled up from the bottom of the rim, so that it would not readily reseat itself, but would be subject to excessive wear and liable to pull further and further out, rather than to fall back to its place if once started from the bottom of the channel. The absence of the canvas strip on the bottom of the rubber, which Mr. Wiles refers to as wholly immaterial, so far as novelty is concerned, would enhance this action by permitting either lobe to stretch away from the other, and the rubber to become distorted by such stretching.

Furthermore, the hugging relation of the rim flange with the rubber to the extreme top of the rim flange and the bulging of the rubber in the part outside the rim, would be very conducive to a cutting action of the relatively small amount of rubber between the wire and the flange of the rim channel, and Mr. Wiles states that the shape of the outer portion of the Grant tire "may be decidedly better than that of the Latta tire as to the matter of protecting the sides of the tire against wearing or cutting on the edges of the flanges of the rim," and he adds the following:

"If Grant had been the first to incline the sides of the exposed portion of the tire inward toward the tread to such an extent as to prevent or materially decrease the spreading of the tire over the edges of the rim-flanges, and if he had been the first to give the rim and the outer portion of the tire such relative shapes as to leave an angle between the rim and tire, above their line of contact on either side any advantage due to such new construction would give corresponding novelty to the whole tire and to the combination of either of the claims of the Grant patent. The fact is, however, that the effect of such shaping of the outer portion of the tire, and such relation of the tire to the rim-flanges was perfectly well understood before the application for the Grant patent, and there was no possible invention in giving this shape to the exposed part of any rubber tire seated in any kind of a rim and held in place by any means whatever."

I agree with the conclusion stated in the first sentence, of the foregoing quotation, and think that there *are* advantages due to the form of the external portion of the tire and the relation thereof to the rim as set forth in the Grant patent, which would give novelty to the whole tire, although I think that the novelty in the whole tire goes much further than that, and involves or includes also the employment of the specific form of fastening and the specific flaring

form of the channel (not novel in themselves, individually) in combination with the features of form referred to by Mr. Wiles.

I do not, however, agree with him that the shaping of the outer portion of the rim tire and the relation of the tire to the rim flanges, referred to by him, were perfectly well understood before the time of the patent, as conjointly operating characteristics, for the purpose of effecting immunity of the tire from cutting, and I do not agree that there was no possible invention in giving this shape to the exposed part of the rubber of *any* rubber tire seated in *any* kind of a rim and held in place by *any* means whatever, as I think that the features referred to may accomplish more and different results in co-operation with certain forms of channel and fastening than with others, and that they do in fact accomplish a new and valuable result in co-operation with the specific form of channel and fastening employed in the Grant tire, as compared with what they accomplish in any of the relations in which they are shown in the structures of the prior art.

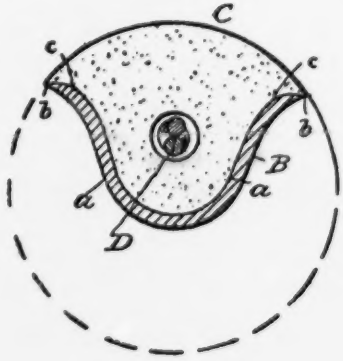
There is certainly no warrant for the statement that these characteristics, operating conjointly, were perfectly well understood in any of the patents thus far considered by me, and in my opinion there is no warrant for that statement in any of the patents referred to by Mr. Wiles in his deposition, his statement being, as I understand, based upon what is shown in the Everett Swiss patent, the Beiersmith patent, the Lenton British patent, the Owen patent, and the Kearsley British patent, which I will consider later.

Grant & Jeffries Patent, No. 470,483, *March* 8, 1892.

This patent was referred to merely as disclosing the feature of having the rubber under slight compression in the direction length-

GRANT & JEFFERIES
U. S. PATENT
No. 470,483

Fig 3.



wise of the rim, the normal or unstrained rubber being a little longer than the periphery of the wheel, and therefore compressed slightly endwise in applying it, instead of being stretched slightly as is the case when in unstrained condition it is slightly shorter than the circumference of the wheel. This compression of the rubber is not described as essential in the Grant patent and is not referred to in either of the claims thereof, and I am unable to see that the tire of the Grant & Jeffries patent, which is in all other respects substantially different from the tire of the Grant patent has any bearing whatever upon the novelty of the Grant patent.

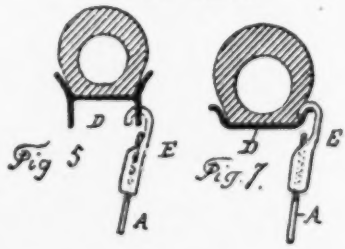
Everett Swiss Patent, No. 8120, *February* 17, 1894.

This patent is for a special construction of wheel spokes and shows merely incidentally certain forms of cushion tire which are illustrated and referred to by Mr. Wiles.

The construction shown in Figs. 5 and 7 indicate a slight space between the inner faces of the rim-flanges and the outer surface of rubber lying between them, affording an opportunity for the rubber to expand somewhat in the space within the flanges, the same as is accomplished in the Grant construction, by having the angle or corner between the outer and inner portions of the rubber located within the outer periphery of the flanges of the rim.

It will be seen, however, that the construction shown in the Everett Swiss patent does not obviate the bulging of the rubber out over the edge of the rim when under compression, as is accomplished in Grant tire by the specified characteristics of form of the outer portion of the rubber and of its relation to the rim.

EVERETT
SWISS PATENT
NO. 8120



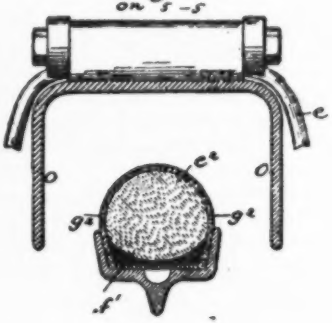
No mechanical fastenings are shown in the tire of the Everett Swiss patent, which throws no additional light whatever beyond what is disclosed in the patents already considered, leading to the production of a reliable and durable mechanically fastened tire.

Kelly Patent No. 321,819, *July* 7, 1885, *and Kelly Patent No.* 362,514, *May* 10, 1887.

These patents show cemented-in tires having a rim of substantially the same form as in the Elliott patent and the rubber also substantially of the same form. They add nothing whatever pertinent to the subject to what is shown in the Elliott patent, but are more remote, because they are not mechanically fastened tires.

KELLEY
U. S. PATENT
321,819

Fig. 10.



Kelley, No. 362,514 of 1887

Fig. 5,

It may be noted in connection with patent 321,819 that while I have referred to it as a cemented-in tire it is also constructed on the stretched-on principle, the patentee stating that it is the aim of his improvement to provide a tire which shall be adapted for application under a high degree of tension, so that in the event of the failure of the cement there would be no danger of the tire being displaced

Woodward Patent No. 443,735, *December* 30, 1890, *and Woodward Patent No.* 481,340, *August* 23, 1892.

These patents both show cemented-in cushion tires and so far as I can see disclose nothing pertinent to the construction of the Grant tire and certainly nothing more than is disclosed in other patents already considered.

Referring to Woodward Patent No. 443,735, Mr. Wiles said:

"Looking at figure 3, it will be seen that the base of the tire rests on the bottom of the channeled flange; that the base-portion of the tire has two outwardly-inclined sides which fit the inner faces of the flaring flanges; that these inclined sides of the base-portion of the

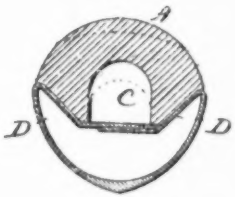
tire do not extend to the upper edges of the flanges; but terminate at some distance below them; that the widest portion of the tire is wholly within the width of the outer portion of the channel; and

Woodward, No. 443,735, of 1890.

Fig 3.

WOODWARD
U. S. PATENT
No. 481,340.

Fig 3



that there is, on each side of the tire, an angle which contacts with the corresponding flange, below the edge of the flange. It is apparent that in any compression of this tire, its side faces will be pressed against the inclined walls of the adjacent flanges, and cannot be forced into cutting contact therewith, although the specification of the patent does not refer to this characteristic of the structure."

I do not think that the above is a fair statement of the fact, as obviously the widest portion of the tire is not within the width of the outer portion of the channel, although it is of less width than the extreme width of the channel. Furthermore it seems clear that Woodward did not contemplate leaving any space within the channel outside of the unexposed portion of the tire to receive the expansion of the exposed portion within it. The unexposed portion of the tire lies in adhesive contact with the inner surface of the rim flanges substantially to the outer edges thereof, which are rounded at their extreme outer edges because made of sheet metal folded or bent at this point.

The general purpose of cushion tires, as they were called, or tires of relatively large external size but with hollows or spaces within them, was to produce a sufficient body of rubber to support the wheel when the rubber is moderately compressed as indicated in dotted lines in Woodward Patent, 481,340, and the conditions are such that the tires are not subject to the cutting action which the smaller solid rubber tires, seated in relatively deeper channels are subject to.

I am decidedly of the opinion that the Everett Swiss patent and these two Woodward patents afford no basis whatever for the assertion made by Mr. Wiles that the effect of shaping the outer portion of the tire, and of the relation of the tire to the rim flanges as set forth in the Grant patent, was perfectly well understood prior to the time of the Grant patent.

Beiersmith Patent, No. 424,452, April 1, 1890.

This patent shows a tire of the clincher class wherein the rubber is held in the rim by the interlocking form of the side flanges of the rim and of the rubber seated therein and clamped thereby.

It was cited merely as showing a construction wherein a slight space was left between the outer part of the rim flanges and the sides of the exposed portion of the rubber lying between them, or in other words for showing the feature indicated in the Everett Swiss patent before considered.

Beiersmith No. 424452 of 1890.

Fig. 1.

The Beiersmith patent, however, refers to this feature as preventing abrasion of the rubber, and it probably does to some extent mitigate the evil commonly experienced in clincher tires, such as that of the Willoughby patent before considered, due to the kneading of the rubber on the edge of the flange gripping into it.

The Beiersmith construction, however, obviously does not deal in any way with the trouble due to the bulging of the rubber out over the edge of the rim flange so as to be nipped between it and the road surface, and in fact adds nothing to what is shown in the Elliott patent already considered.

Mr. Wiles, after commenting upon the statements in the Tiberlake patent and Elliott patent and this Beiersmith patent relative to guarding against or mitigating the cutting action commonly experienced in rubber tires said:

"These three patents obviously afford a complete disclosure of that principle or feature of construction involving such relative forms of the rim and tire as to leave angular spaces between the edges of the rim-flanges and the adjacent faces of the tire—the definitely stated purpose of providing such angular spaces being to prevent abrasion of the tire upon the edges of the flanges, 'when compressed by contact with the ground or pavement.'"

I do not agree with the above statement at all. As I understand the matter Timberlake sought to avoid the cutting action by dispensing with the rim flanges entirely and producing a substantially different tire structure from one in which the rubber is seated in a channel rim; Beiersmith merely avoided or mitigated the evil due to the kneading action of rubber against the edge of a gripping flange, which was the device for keeping the rubber in place in his tire, and Elliott sought to mitigate the trouble merely by rounding

English 1892
Willoughby . No 18030

Fig 11

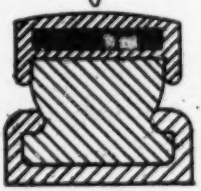


Fig 15

Fig 17

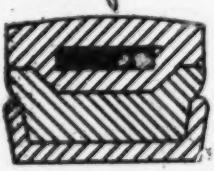


Fig 20

Fig 26

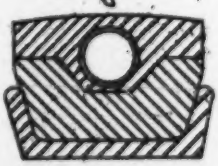


Fig 27

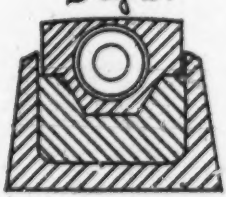


Fig 30

Fig 31

the edge of the flange or blunting it as a cutting instrument, so that the rubber, admittedly exposed to its action, is less liable to frequent cutting action than if the flange edge were sharper; while Grant avoided the difficulty in a tire structure in which the rubber is seated in the channel of a flanged rim, but in which the form of rubber and rim channel are such and so related to one another that the rubber does not come between the road surface and rim under the conditions incident to use of the tire.

I am unable to see that the disclosures of the Timberlake, Elliott and Beiersmith patents were availed of in any way in the production of the Grant tire, or that they gave any information in the direction of producing the Grant tire or of producing anything other than the tires actually shown in the Timberlake, Elliott, and Beiersmith patents which obviously are substantially different tire structures from that forming the subject of the Grant patent sued upon.

Willoughby British Patent, No. 18,030, *of* 1892.

This patent is significant merely as showing the form of rim, taken as an individual element, substantially the same as that of the rim of the Grant tire.

The form of rim, however, has no special significance in the Willoughby structure, and no special co-operative relations with the other elements, as is evidenced by the fact that various other forms of rim are shown in the Willoughby patent as alternative constructions for the one shown in Fig. 15 (chosen by Mr. Wiles) or the one shown in Fig. 30, which is illustrated on the diagram produced by me.

The tire of the Willoughby patent is of a totally different type from the rubber tires thus far considered, and consists of a flexible metallic tread portion supported on the rim with an intervening strip of rubber serving as a cushion for the metallic tread portion. The flexibility of the tread portion is afforded by making it in the form of a series of short blocks strung along a continuous band which fastens them together and ties them securely upon the outer surface of the rubber strip, which is itself confined laterally by the side flanges of the channel rim.

Various forms of bands are employed for fastening the metal blocks upon the rubber strip, among which are flat bands, such as illustrated in Fig. 15, and a pair of wires such as illustrated in Fig. 30. As nothing but tensile strength is required in these bands it is practically immaterial whether a flat band, or one or more wires, is used, and there is nothing whatever in this patent to suggest that any new result would be obtained by using the wires rather than the tape, or the reverse, in any tire structure.

In fact Mr. Wiles, in speaking of this, says:

"This disclosure is interesting merely as affording another instance of the interchangeability of a flat band and a pair of independent retaining-wires, as the means for holding a rubber tire in its place in a channeled rim of any desired cross-section."

753

Obviously Mr. Wiles had not learned, up to this point, what was an important factor in Grant's discovery, namely, that the specific form of fastener forming an element of Grant's tire, was essential to the effectiveness of the tire as a unitary structure, and could not be exchanged for other forms of fastener, equally good, or possibly better, in other relations, without serious detriment to the efficiency of the tire.

Lenton British Patent, No. 14,812, *of* 1890.

This patent shows a cushion tire of the cemented-in type. The rim in the form shown in Fig. 4, which is chosen by Mr. Wiles comprises practically two semi-circular channels to receive two corresponding ridges on the inner surface of the rubber tire, and it is called in the patent a duplex or double rim.

Lenton, No. 14,812, of 1890.

Fig. 1.

Mr. Wiles called especial attention to the statement that the edges of the rim "are brought outward and in some cases rolled over, so that the cutting action of the tire of the ordinary air cushion or pneumatic is prevented," and that according to the construction of the tire as set forth there was "no tendency to overlap the rim, the action of the superincumbent weight being rather to press the rubber well into the hollows of the rim, and to prevent it from springing off as might happen to the tire and rim of spherical section."

Lenton's tire is of the cushion variety and has large cylindrical openings in the cylindrical portions seated in the rim channels, and I understand that it is by reason of this space or vacancy in the body of the rubber itself that it crowds back into the rim rather than is caused to bulge out over the rim when compressed against the road.

The shape of the outer portion of the Lenton tire does not, in my judgment, differ substantially from that of the Grant tire, and Mr. Wiles states that:

"The Lenton patent not only shows this peculiar cross-section of the outer portion of the tire, but it also illustrates the expedient of giving the rim and tire such relative shapes as to leave an angular space between the edge of each rim-flange and the corresponding face of the tire. That is to say, the Lenton tire and rim are an

embodiment of both the expedients for preventing abrasion of the tire on the edges of the rim-flanges; and it distinctly points out the functions of these two expedients. The angular space between each rim-edge and the corresponding wall of the tire is not great, as shown in the Lenton patent, but it is sufficient to afford a basis for the statement in the specification that the cutting action of the tire is thereby prevented."

I think that the above statement is entirely incorrect. The rubber in the Lenton tire is in adhesive contact with the inner surface of the channel clear up to the edge of the same, which is rounded by folding the metal forming what the patentee calls "a clear non-cutting edge." To my mind there is not the slightest suggestion in this Lenton patent of the feature of leaving an angular space between the rim edge and the side of the exposed portion of the tire to receive the expansion of the rubber so that it will not bulge out over the rim edge, this function being provided for in the Lenton tire by the tubular spaces or cavities in the body of the rubber itself and into which the overlying rubber is crowded when subjected to compressive pressure against the road.

Mr. Wiles also asserts that in his judgment the "Lenton patent is precisely as pertinent as it would be if retaining wires were threaded through openings in the tire and had their ends joined so as to form the independent endless retaining wires of the Grant patent, or of any of the many prior patents to which I referred as showing such retaining wires." I myself am inclined to the view that the Lenton structure would be, as a practical matter, no nearer to Grant if such wires were used instead of cement to hold the tire in place, and I think that undoubtedly such a tire would be inferior to many of the prior art structures for the use for which the Grant tire is designed.

I am decidedly of opinion that the Lenton patent affords no warrant for the statement made by Mr. Wiles in his discussion of the Latta patent that the effect of the shaping of the outer portion of the tire and of the relation of the tire to the rim flange, exhibited in the Grant tire, was perfectly well understood before the application for the Grant patent.

Owen Patent, No. 365,091, *June* 21, 1887.

This patent shows a cemented-in tire of the cushion type, that is, one in which the solid rubber does not fill the rim channel but in which space is left for the rubber to recede into when subjected to compression upon the road.

The Owen patent shows numerous forms of rims and of rubber, some of which are of the distinctive solid rubber type, but the principal point in any way pertinent to the subject of the Grant patent is the form of the outer or exposed portion of the rubber as shown in Fig. 6, for example, which is described as made with a view to avoid the cutting by making the sides "of a flat or concave form or of other form falling within the semi-circle, so that when sub-

jected to pressure the lateral expansion or enlargement will not cause the tire to project beyond the rim."

Owen, No. 365,091, of 1887.

Fig. 6.

Beyond this the Owen patent contains nothing whatever in common with or in any way suggestive of the construction forming the subject of the Grant patent.

Kearsley British Patent, No. 4,352, *of* 1883.

This patent merely shows a tire of the clincher type with the outer or exposed portion convergent and similar in shape to the exposed portion of the rubber of the Grant tire. It shows this form, however, merely as one of a half a dozen different forms that may be adopted, and obviously as having no special co-operative relation to the other structural features of the tire.

Kearsley. No. 4352 of 1883.

Fig. 1. Fig. 2.

Fig. 3 Fig. 4.

Fig. 5, Fig. 6.

Coops' Design Patent, No. 20,678, *April* 14, 1891.

This patent merely shows a sectional form of rubber practically the same as that shown in Fig. 6 of the Owen patent, except that it has a longitudinal tubular hole through the body of the rubber.

It adds nothing to what is disclosed in the Owen patent that is in any way pertinent to the subject matter under discussion.

The foregoing are all of the patents which were discussed by Mr. Wiles in his deposition and while there are many others in evidence in the case, none of them, in my opinion, comes any nearer to the subject matter of the Grant patent than those already discussed, or would throw any additional light on the matter if one were undertaking to devise a tire exempt from the defects found to exist in all of the tires up to the time of the Grant patent.

Coops #20678
(design)

In summing up the prior art after his discussion of the several patents, Mr. Wiles states that it seems to him to be demonstrated that the Grant patent disclosed nothing novel and that the production of the Grant rim and tire involved no invention. He then points out that the elements or features individually were old, but in doing this he has practically to divide the rubber into two parts and to find that the form of the part contained in the channel was old in some structures and the part outside of the rim was old in other structures, as for example, if he should shave off the top half of the rubber of the Willoughby patent No. 5,924, of 1892, (Fig. 8*a*) and unite it to the lower portion of rubber strip of Willoughby patent No. 18,030, of 1892. (Fig. 15 or Fig. 30). There is no example in the prior art, as is obvious from an inspection of the chart produced by me, of a rubber portion of rubber tire that taken as a unit has the characteristic of form of rubber portion of the tire of the Grant patent, and of a large number of the tires which have been marketed or which others have attempted to market since the introduction of the Grant tire into practical use.

Mr. Wiles also comments on my explanation that an important characteristic feature of the operation of the Grant tire is its capacity for yielding to strains tending to dislodge it from the rim and distributing the said strains so that they will not be concentrated upon

a small portion of the rubber and liable to tear it apart, the construc tion being also such that the rubber immediately reseats itself a soon as the dislodging strain ceases. He apparently recognizes an does not question that the Grant tire does have this mode of opera tion, but asserts that if it does the tire of the Latta patent also doe by reason of the same agency acting in the same way.

This is not the fact; the Latta tire is held in its channel by the con tractile force of spring wires. This force should be sufficient to hol the rubber down to the bottom of the channel, since if it yields a all the elongation of the spring wires will almost certainly allow i to be completely dislodged and either thrown wholly out of th channel or rolled over therein, so that it will not reseat itself prop erly after the strain has passed. Furthermore, even if the Latta tir did operate to yield and reseat itself like the Grant tire it would b by reason of different agencies, as in the Latta construction, th yielding and reseating would be due to the elastic elongation an contraction of the wire, while in the Grant construction it takes plac with no appreciable elongation and contraction of the wires, but b reason of the elasticity of the rubber lying between the wires an the bottom of the rim channel.

Grant's way of accomplishing the result is entirely efficient an practical, while the Latta way, if capable of operation in the manne described at all, is inefficient and, in my judgment, of no practica utility whatever in a tire for regular use on carriage and wago wheels under the ordinary conditions in which the Grant tires ar used.

Mr. Wiles also asserts that the shape of the external portion o the tire has nothing whatever to do with this alleged mode of opera tion, and that the bringing together in a single structure of the par ticular external tire section shown in the Grant patent, with rim tire base and retaining wires adapted to have the alleged new mod of operation, is obviously a mere aggregation of features of construc tion.

I do not agree with this statement, but on the other hand believ that it is essential for the practicability of the mode of fastening th rubber in the rim, which is characteristic of the tire of the Gran patent, that the external form of the rubber and channel in th specific form shown in the Grant patent should also be employed.

As Mr. Wiles has pointed out several modes of construction wer suggested with a view to preventing the cutting or excessive wea of the external portion of the tire, all of which, so far as appear from Mr. Wiles' testimony, are equivalents to one another, an most of which are, I believe, adequate for the purpose for whic they are designed, if employed with a tire otherwise rendered efficient in some way in the matter of permanence of attachment t the rim.

In the Grant tire, however, the character of the fastening is such that the tire must be especially exempt from any cutting or wearing or kneading action between the wire and the side of the rim channel and so far as I know the specific form of the external portion of th rubber and channel, as shown in the Grant patent, is the only on

suitable for use with the arrangement of fastening wires and rim channel to obviate breakage of the rubber away from the fastening.

Obviously it would be of no use to have the fastening hold well if the rubber was easily cut or broken or torn away from the fastening, and it would be of no use to protect the tire from cutting or abrasive action if the fastening were such that it were liable, at any time, to be dislodged from the wheel and it is, so far as I know, only by the conjoint action or effect of all of the specific features of construction exhibited in the Grant tire and recited in the claims thereof, that the results of reliability and durability in a solid rubber tire for carriage and wagon wheels have been attained.

It is obvious, furthermore, that the Grant tire construction would not be produced merely by the selection of the best form of its component parts merely with a view to the best performance of each individually, but that they have been organized each and every one of them with a view to its co-operative relationship to all of the others, making a unitary structure, no one of the specified features of which could be dispensed with or changed for some other, which in other relations might be equally good or better, without serious detriment to the tire, and instead of availing himself of the discoveries or inventions of the other prior constructors, following the first example of a tire comprising a rim, a rubber and mechanical fastening of any kind, it seems to me that Grant practically discarded all of the discoveries or contrivances of the prior tire constructors or inventors, and produced a substantially new organization or combination of co-acting characteristics resulting, as stated in his patent, in "a rubber tired wheel rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market."

Adjourned to Friday, December 8th, 1905, at 10:30 A. M.

NEW YORK, *December 8th*, 1905.

Met pursuant to adjournment.

Present: T. W. Bakewell, Esq., and Border Bowman, Esq., for Complainants, C. C. Linthicum, Esq., for Defendant.

Direct examination continued:

Q. 4. Defendant's expert, Mr. R. H. Wiles, has quoted from the opinion of the United States Circuit Court of Appeals for the Sixth Circuit (116 Fed. 376) an excerpt containing the following statement:

"We learn now that this capacity for any beneficial yielding is dependent upon the wires being properly adjusted originally, and that this proper tension depends upon the right judgment of the workman.

* * * * * * *

"How, then, is it possible for the public to obtain a knowledge of this new function, its advantages, or how best to secure the proper tension of the wires to allow of this capacity?

"If it exists in Grant's arrangement of old parts it is an accidental

mode of operation dependent upon the normal tension of the retaining wires in the particular tire."

Is it true, from your observation and experience, that this beneficial yielding is dependent upon the wires being adjusted for that purpose?

A. I do not know the basis for the statement in the clause first quoted, as I do not recall any testimony to that effect in that case in which I testified as expert on behalf of complainant and was familiar with the record, and especially the expert testimony.

It is not the fact that the capacity for beneficial yielding of the wires depends upon any special adjustment of the tension of the wires, and so far as my observation and experience have gone it is absolutely impossible to adjust the tension of the wires, so that this yielding capacity will not be exhibited in the tire. It is necessary only to apply the fastening substantially as any fastening of the same general character would be naturally applied by competent workmen, that is, by drawing the wires as tight as practicable, but not quite to the limit of their ultimate strength, and when this is done the tire will inevitably have the capacity for yielding slightly to strains tending to pull either side of the tire outward from the rim channel.

I have recently observed tests with a tire of the construction shown in the Grant patent applied in the usual manner on a carriage wheel driven over a city street, and having an appliance for indicating a rising movement of the tie wire in the direction outward from the bottom of the channel, and the indicator showed that such rising movement was of frequent occurrence, and almost always took place if the wheel were traveling with a slight side sliding or slewing movement.

The indicating device used consisted of a wire fastened to one of the tie wires within the rubber and extending therefrom radially inward through a hole made in the tire rim and wheel felly. The inner end of this wire thus stood between the spokes of the wheel near the inner periphery of the felly and was provided with a laterally projecting finger or marking point. The wheel felly had affixed to it a carrier in which was placed a piece of glass having its face coated with India ink against which the marking point bore. Thus any rise of the tie wire of the tire or movement in the direction outward from the bottom of the channel would produce a corresponding and equal movement of the marking point on the prepared glass surface, and after a short period of travel of the wheel an observation of the glass showed the marks of the pointer which had traveled in response to the outward or yielding movement of the tie wire.

I also saw another form of marker tried, in which the marking point was connected with a cross wire secured to both tie wires in such manner that when one tie wire rose relative to the other it would give a swinging movement to the pointer arm which would be magnified as compared with the actual movement of the tie wire. With this construction a prepared surface applied to be acted upon by the marker showed that the marker had moved and it was also

very apparent to the eye that the marker moved when the adjacent part of the tire came down to the ground while the wheel was traveling with a slight slewing movement.

Cross-examination by Mr. LINTHICUM:

Defendant's counsel objects to the testimony of this witness in relation to the experiments made or witnessed by him, notice of the making of which was not given to the defendant or defendant's counsel, on the ground that the same are entitled to have no evidential value by reason of the lack of such notice and opportunity to inspect and witness the same, and because any such tests so made indicate an attempt to make evidence ex parte in favor of the complainants, and because it deprives the defendant of an opportunity to intelligently cross examine the witness upon the precise matters concerning which he has testified, which objection would not be at all obviated by a repetition of and an opportunity given to witness such repetition.

X Q. 5. In various portions of your present deposition you have made positive statements as to the relative efficiency of the Grant construction and other constructions of the prior art; and in some instances you have stated that prior devices failed in operation or were inefficient. Will you please state what personal knowledge you have as to the use of any of the prior art structures to which you have thus referred?

A. So far as I can now recall my personal knowledge or observation was confined principally to the tires of the cemented-in class, such as used on bicycle wheels, and I also had some personal observation of tires such as shown in the Elliott patent, 440,702, used on bicycle wheels, and I have had some personal knowledge and observation of the use of tires of the clincher type on cabs or horse drawn vehicles.

X Q. 6. What personal knowledge have you as to the various forms of tires illustrated on your diagram of rubber tires at the right hand end of the sheet, and which are grouped under the general title "After Grant"

A. I believe that my personal knowledge is limited to the one marked "Kokomo" and the one marked "Goodyear Wing Tire" in channel. So far as I recall, these are the only actual tires in this group which I have personally seen and handled.

X Q. 7. Concerning which of the tires of that group have you testified?

A. The two referred to in my preceding answer. I think that the tire marked "American" may be a representation of the tire made by the defendant in the case of The Rubber Tire Wheel Company against the Columbia Pneumatic Wagon Wheel Company, in which case I was also personally familiar with that tire, and testified as expert with reference to it.

X Q. 8. Which of the tires of that group do you regard as coming within the scope of the Grant patent, answering this question more particularly with reference to the cross sectional form of the rubber?

A. I should regard them as all embodying substantially the construction forming the subject of the Grant patent except the ones marked "New England tire," "Morgan & Wright Tire, Whitman & Barnes Tire, Calumet and Wemaka." I refer to the "Wemaka" shown in the figure in the extreme lower right hand corner of the sheet and not to the one marked "Compts.' Ex. Piece of Wemaka Tire."

Possibly there might be some doubt as to the tire marked "Victor" by reason of having the rubber a little wider or thicker above the outside of the rim than between the flanges of the rim, and as to the one marked "Batavia" and one marked "Piece of Wemaka Tire" by reason of the variation in the form of the rubber from that shown in the Grant patent, but I should not myself regard such variation as a material departure from the subject matter of the patent.

X Q. 9. If you found in the New England tire, the Morgan & Wright tire, Whitman & Barnes tire, the Calumet tire and the Wemaka tire parallel longitudinal apertures located within that portion of the tire adapted to lie below the tops of the flanges, and to receive therein independent retaining-wire as fastening means, would you then consider those tires as falling within the scope of the Grant patent?

A. Yes, as I understand the question that the assumed tires would be practically identical with the tire of the Grant patent, except possibly the Whitman & Barnes tire. If the drawing is intended to represent the rubber as made of two separate and separable strips I should not regard the tire as coming within the Grant construction.

X Q. 10. And if the rib or web connecting the two bulbed parts of the band in the Calumet tire were omitted, thereby converting the circular marginal portions of said band into two independent retaining-wires, you would consider that construction as falling within the Grant patent, would you not?

A. Yes, understanding that the rubber was correspondingly changed so as to have two separate passages for the wires instead of a single passage as actually shown.

X Q. 11. I infer from your last answer that if two independent retaining-wires were threaded through the slot of either of the tires shown in your diagram and marked "New England tire" and "Morgan & Wright tire" respectively, such wires being respectively in the extremities of the slot, so as to be separated from each other a distance corresponding substantially to that shown in the Grant patent, you would not consider such a construction to be within that patent; am I correct?

A. Not entirely. The construction would obviously be different from that shown and described in the Grant patent. Whether or not the difference would be important practically could, I think, be determined only by a somewhat extensive actual use of the assumed tire. My judgment is that such test would show that the assumed tire was greatly inferior to the Grant tire, and that it would prove to be entirely unmarketable at the present day.

If, however, test should show that it did not differ practically from

the tire of the Grant patent, I see nothing in that patent that would necessarily exclude the assumed structure from its scope.

X Q. 12. What function do you ascribe or does the Grant patent ascribe, to the wall of rubber between the parallel wire apertures or passages disclosed in that patent?

A. No specific function is ascribed to that particular portion of the rubber as distinct from the rest in the Grant patent. I myself should say that its function as contrasted with the construction in which this portion was absent, as in the illustrations of the New England tire and of the Morgan & Wright tire, is to give that much more strength and body to the rubber of the tire connecting the part below the fastening wire with the part above or outside of them, and also to definitely determine the locality of the fastening wires in the rubber as would not be done if, for example, two wires were threaded through a single opening, such as illustrated in the New England and Morgan & Wright tires.

X Q. 13. Have you any doubt that if two wires were threaded through the elongated transverse*ly* slot of the Morgan & Wright tire and tightly stretched, the positions of such wires being respectively in the extreme ends of such slot, that those wires would be embedded in the rubber and provide seats for themselves in substantially the same way and to the same extent that the marginal cylindrical edges of the band in the Calumet tire are seated in the rubber?

A. I think that they would to some extent, at least, make seats for themselves or depress the rubber immediately beneath them with a corresponding rise of the rubber lying between them.

I have very great doubt, however, whether or not they would remain in this position under the conditions incident to use. Unless actual tests showed to the contrary, or rather until such showing was made, I should expect that the wires would not remain at the extreme sides of the slot in the rubber, but that they would work out of place, and fail to give satisfactory service.

X Q. 14. I believe you have stated that you consider the construction of the American tire, shown in your diagram, as falling within the scope of the Grant patent. Is that correct?

A. Yes, that was certainly my view of the actual tire if it is, as I understand, the tire of the defendants in the Columbia case. I do not know just how accurate the drawing marked "American" is, but I should regard a tire such as shown in the said drawing, as coming within the Grant patent, assuming that it has the canvas strip on the lower part which the actual defendant's tire in the case referred to did have, and which I understand has been used on all the tires actually marketed since the time of the Grant patent, although it is not represented on several of the figures of the diagram.

X Q. 15. Where would you locate the angle of corner between the outer and inner portions of the American tire, shown in that figure?

A. There is no angle or corner as the sides of the outer part are a little fuller than is shown in the Grant patent, and merge into the sides of the inner part with a continuous curve. The widest part of the tire, which is the point from which the inner part converges inwardly and the outer part converges outwardly, is located

in this American tire as shown in the cut, a little within or below the outer periphery of the rim flanges.

X Q. 16. A plane passing through the widest part of the American tire would fall where with reference to the wire apertures?

A. I should judge it would intersect the wire apertures very near the top of the same, or possibly it would be a trifle above them.

X Q. 17. You stated that you thought the "Comp'ts' Ex Piece of Memaka Tire" was not excluded from the Grant patent, or rather you did not exclude it in your answer; assuming a channel within which the base portion of this tire is intended to fit and independent retaining-wires threaded through the passages of the tire, state if you please where the upper edges of the flanges should terminate relatively to the plane of the wire to make the structure correspond to the Grant patent.

A. They should extend to a level above the wire apertures to bring the construction within what is specified in the claims of the Grant patent, and also in my judgment, for practical efficiency of the tire.

X Q. 18. Assuming a channel threaded to the rubber tire of your diagram marked "International Two-wired Tire," the upper edges of the channels should, I presume, extend above a plane intersecting the tops or upper edges of the wire passages; is that your understanding?

A. Yes.

X Q. 19. If the plane extended through this tire, just touched the upper edges of these openings, and also just touched the tops of the flanges, the construction would be within the Grant patent, would it not?

A. I should so regard it.

X Q. 20. But if the flanges only extended to a level with the angles or corners between the inner and outer portions of the rubber of that tire, it would not fall within the Grant patent, would it?

A. It would not correspond literally to what is specified in the claims of the Grant patent, and I will add that in my judgment the assumed tire would be practically very markedly inferior to the tires constructed in exact accordance with and as specified in the Grant patent, as even the increased height of the wire holes indicated on this drawing and the diminished height of the rim flanges assumed in the question, are, so far as my knowledge and experience have gone, important factors in the efficiency of the tire.

X Q. 21. Will you mark on my copy of "Complainant's Exhibit Livermore's Diagram of Rubber Tires" or better still, on a cut or drawing similar to that shown in this diagram representing the International Two-wired tire, lines conforming to the planes, marking the tops of the flanges as discussed in your last two answers, the upper line indicating the height of the flanges which would make the construction conform to the Grant patent and the lower line coinciding with the angles or corners between the inner and outer portions of the rubber, conforming also to the position of the tops of flanges of a channel which would not be within the Grant Patent?

A. I have done so, and have marked the line through the corners 1. I do not understand that there is any definite limit that the

height of line marked 2, representing the tops of the rim flanges, should be above the line marked 1, to bring the construction within what is specified by the claims of the Grant patent, but I have drawn the line through at about the height to which I think the rim flanges should extend to give as good a practical result as would be attainable with the tire shown on the sketch. I should say that on the scale shown on the sketch the rim flanges should extend somewhere from a sixteenth to an eighth of an inch above the corner on the side of the rubber for practical efficiency.

X Q. 22. In your answer to X Q. 19 you stated in substance that if the plane had extended through this tire just touched the upper edges of the wire openings, and the tops of the flanges, the construction would be within the Grant patent. The line 2 placed on your sketch is drawn considerably above the tops of the wire passages, and so does not conform to your answer; if it were drawn in accordance with your answer then the difference between the construction which would be within the patent and the construction which would be without the patent would be measured by one-half the diameter of the wire passage, would it not?

A. Yes. The seeming inconsistency between my last answer and my answer to X Q. 19 was because I did not understand that X Q. 21 called for the lowest position of the upper line that would bring the construction literally within the claims of the patent.

Defendant's counsel offers in evidence the cut of Complainant's Exhibit Piece of International Two-wired Tire with the lines marked thereon by Mr. Livermore, and the same is marked "Defendant's Exhibit International Cut No. 2."

X Q. 23. So far as the advantages due to the shape of the channel and the cross sectional shape of the tire and the location of the fastening band below the plane of the edges of the flanges are concerned, you would find them all present in "Complainant's Exhibit New England tire," and "Complainants' Exhibit Morgan & Wright tire" excluding from consideration the advantage due to the provision of two separated wire passages, and the employment of two independent retaining wires therein, would you not?

A. Yes and no. I do not see that there are any advantages due to the shape of the channel and cross sectional shape of the tire shown in the Grant patent, except in co-operation with the two independent wires as the fastening device.

I say yes because if there are any advantages due to the shape of the channel and rubber and location of the fastening (irrespective of its character except that it is a band) below the plane of the edges of the rim flanges, in the construction shown in the Grant patent, obviously there must be the same advantages in such form and location in a structure like the New England tire which is identical with that of the Grant patent so far as these matters of form and location are concerned.

With the kind of fastening shown in the New England tire and in the Morgan & Wright tire, however, I do not think that the form of rubber and channel would possess any substantial advantage over

other forms, such for example as that shown in the Greene patent, except that the external form of the rubber is better than that shown in the Greene patent. A better example of what I mean is shown in the diagram "Beale No. 11,329, of 1888," this being a construction which was in evidence in some of the other cases, and I think in the present case, although not discussed by Mr. Wiles in his deposition, and consequently not hitherto mentioned by me in the present c[ase].

X Q. 24. Assuming any fastening that would hold the rubber t[ire] like the New England and the Morgan & Wright in the seat, would not the shape of the channel and the cross sectional form of the tire have the advantages due to the avoidance of cutting which you have ascribed to the Grant tire?

A. They would so far as the shape of the external portion of rubber and its relation to the flanges are concerned.

X Q. 25. Then the invention of Grant was not characterized by the associating together of a channel and tire, such as shown in his patent, with a retaining device located within the body of the tire and within the periphery of the flanges; is that true?

A. I think that the invention is not characterized in the sense of differentiated from prior structures by merely the features referred to in the present question, although the form of the external portion of the rubber and its relation to the flanges of the rim are, I think, substantially different from and better than any in the prior art, and might possibly be regarded in themselves as amounting to an invention.

Except for this which is not pointed out or claimed in the Grant patent as a separate invention embodied in the whole structure and embodiable in other structures, the characteristics named in the question would be found, for example, in the tire of the Elliott patent, No. 440,702, of those referred to by Mr. Wiles in this case.

X Q. 26. What would be the difference in the yielding capacity of one edge of the marginally beaded band of the Calumet tire and either of the wires of the Grant tire in a wheel having the same size of channel and tire?

A. I think that either edge of the Calumet tire band would be practically unyielding to outward strain such as is due to side pressure on the rubber tending to roll it in the channel.

X Q. 27. Do you regard the Calumet tire band as practically inelastic and non-stretchable?

A. Yes, practically inelastic in the way of tensile elongation and contraction, the same as the wires of the Grant patent.

X Q. 28. And you regard the possible elongation of any wire or band fastener as being wholly unimportant to produce the function of permitting the tire to rise at one edge, and then reseat itself, do you not?

A. Yes, the action would take place just the same if the wire were in fact absolutely incapable of elongation, under the tensile strain.

X Q. 29. And if it were capable of elongation under tensile strain produced by lateral thrust on the exposed portion of the tire, that elongation would tend to permit rather than to restrain the rising of one edge of the tire under lateral thrust? Is not that true?

A. Yes.

X Q. 30. Now do you regard it as possible, and if so, to what extent, for one edge of the Calumet tire to rise under lateral thrust?

A. It probably is possible to some extent that might be measured, but I do not think that it would be possible to any appreciable extent to effect a distribution of the strain on the rubber.

X Q. 31. And whatever rising is possible in any tire having an inelastic or non-extensible fastening, is due to the yield of the rubber lying below the fastening itself, is not that true? I have in mind of course a structure like the Grant patent or a structure like the Calumet tire.

A. It is true of a structure like that of the Grant patent, but whatever rise there might be for either edge of a structure like that of the Calumet tire would, I think, be due entirely to the possibility of springing or straining tortionally the metal band. Any tendency to raise one side of the tire by the side strain, such as would occur in the use of the tire tends at the same time rather to press down the other side of the tire and with a construction such as shown of the Calumet tire these two tendencies would be about balanced on the metal band, no part of which would, I think, be drawn out by reason of the yielding of the rubber lying between it and the bottom of the channel around the periphery of the wheel.

The band of the Calumet construction would rise by reason of the yielding of the rubber lying between it and the bottom of the channel if the tire at the rising point were subjected to a bodily radial pull outward from the wheel channel, but such a strain as that never arises in the use of a wheel.

X Q. 32. I am not talking about conditions that never arise, but am assuming, of course, just such a lateral thrust on the exposed portion of the Calumet tire as you say will in the Grant produce the function in the tire of rising at one edge, and I am asking first, in order to make certain of our ground whether in the Grant tire, according to your theory, that rising is not permitted solely by the compression of the rubber beneath the wire at the side upon which the strain is applied? Is that right?

A. Yes, it is due to the yield of the rubber lying between the wire on that side and the bottom of the channel around substantially the entire periphery of the wheel, except in proximity to the point where the strain is applied.

X Q. 33. And now would not the same action take place in the Calumet tire, so far as yielding is permitted in that tire?

A. Possibly it might. The primary resistance to the rising of one edge of the band would, I think, be afforded by the web connecting it with the outer edge of the band which is pressed down, rather than pulled outward, by the assumed strain.

The edge that was pulled outward would therefore yield only by the torsion of the band and I think would yield only to a very slight extent if measurable at all. I suppose likely that to the extent that it did yield outward it might involve the compression of the rubber between it and the bottom of the channel, but the torsional strain would have such a complex effect in changing the pressure relation of the band relative to the rubber that I am not prepared

to say that the same action as referred to in the preceding question and answer would take place to the extent that the yielding might occur in the Calumet construction.

X Q. 34. The effect of the lateral thrust upon the exposed portion of any tire seated in a channel having flaring sides or flanges, and provided with wires below the edges of the flanges, such as the Grant patent for example, is to cause the rubber of the tire on the side away from the thrust to be compressed, is it not?

A. Yes, it tends to crowd the rubber on that side inward towards the channel.

X Q. 35. And is not the wire on that side pressed down rather than pulled outward by the strain?

A. The pressure is inward rather than outward, but I don't think that it has any inward movement.

X Q. 36. In the Calumet tire to the extent that one edge of the tire would raise, I understand you to say it is due to the torsion of the band; would that mean that the band was raised at the edge on that side of the tire to which the strain or thrust was applied, while the other edge of the band would be depressed, the torsional movement taking place around a longitudinal axis midway between the edges of the band?

A. I have not attempted to determine just exactly what the movement, if any, would be, and I do not see how it could be determined except by practical test. It seems to me obvious, however, that an outward movement of one edge of the Calumet band while the other edge had no outward movement, would involve a torsion of the band, about some longitudinal axis not necessarily at the middle of the width of the band.

X Q. 37. And in any band tire there would be to the extent to which yielding is permitted, and consequent rising of one edge of the tire under lateral thrust, the same kind of a torsional movement as there is in the Calumet tire?

A. Yes, in any band tire of that nature, of which the tire of the Everett patent, 440,702, and the New England tire and the Morgan & Wright tire are examples.

X Q. 38. And this permissible yielding would be greater in a tire in which the retaining means is a comparatively thin band, as for example in the Elliott and Morgan & Wright than it would be for example, in the New England tire; is that true?

A. The assumed action would take place, if at all, I should judge, more easily with a thinner and more flexible band than with a thicker and more rigid band.

X Q. 39. And the action, so far as the yield of the tire and the rising of one edge under lateral thrust would occur in a tire of the construction shown in the Willoughby British patent and the Latta U. S. Patent (I mean the Willoughby patent 5,924, of 1892) in the same way as in the Grant patent, would it not?

A. No. I suppose that there would be some yield of the rubber between the wire and the bottom of the channel due to the increased tension of the wire if the tire should be pulled outward at some point, which action would be like that which takes place in the Grant tire,

but the principal or primary yield would be due to the extension of the wire itself which is made longitudinally elastic for that purpose. It is obvious that in the tire of the Willoughby patent no rising or outward movement of the rubber was contemplated as the dovetail or clincher form of the channel precludes that, and I understand also that Latta contemplated having sufficient initial contractile elasticity in his wire to keep the rubber permanently seated in the bottom of the channel, and I think there is no doubt that with his construction, unless there were sufficient contractile elasticity in his wire to hold the rubber down it would almost certainly be dislodged in a short period of actual use.

X Q. 40. Very well, but take a tire like the Rodgers, 539,826, Fig. 7, which is not of the clincher type and has not, as I understand it, extensible retaining wires, would not the yielding action due to lateral thrust on the exposed portion of the tire take place in the same way as in the Grant tire?

A. No, because so long as this tire remains in operative position there is no rise of either side of the rubber from the channel rim.

X Q. 41. Do you know that the base of the tire of the Grant patent rises under lateral thrust?

A. Yes.

X Q. 42. How do you know it?

A. You can see it rise in a tire having a piece cut out or a vacancy through which you can see the relation of the channel and rubber and the tests that I described in my answer to Q. 4 show that it in fact rises under the conditions of actual use on the road, so that having seen those tests I am warranted in saying that I know that it does rise.

X Q. 43. And you have made no corresponding test to determine whether the tire would rise at one edge if constructed in accordance with Fig. 7 of the Rodgers patent, and fitted to a suitable channel?

A. No, but obviously the form of rubber and channel is such that there is no rise of rubber from the channel when the tire is in normal working condition.

X Q. 44. If it is so perfectly obvious to you that the Rodgers tire would not raise, why was it not equally obvious that the Grant tire would raise, and why the test?

A. I never felt any doubt that the Grant tire would rise and does rise in practice, although this probably would not be so obvious to the general observer as the fact that the Rodgers one would not rise in its normal operation. The reason that it is not obvious that the Grant tire would rise to the general observer is that the tire as a whole is being pressed inward towards the bottom of the channel by the reaction of the road surface at the time when the action in question is taking place, and it would not be unnatural to suppose that the strain derived from the road could never produce an actual outward strain on any part of the tire.

So far as I have been concerned with the tests, I was merely requested to see them after the appliances had been prepared for making them, which was not done at my request and was not necessary in order to assure me that the action took place, although possibly it

gives me more warrant for saying that I know it takes place as an observed rather than deduced fact than I had before seeing the test. Further than this I do not know why they were made, but assume that they were made at the instance of counsel for complainants with a view to the evidence in this case.

Question de bene esse and subject to the objection heretofore entered as to this test:

X Q. 45. Did you preserve the chart showing the yield of the tire?

A. I did retain one or two—two I believe—that were made in my presence, but do not now have them with me. I understand that this matter will be gone into and the charts and appliances will be produced and explained by another witness or other witnesses.

X Q. 46. If these tests were accurate these charts would be the best evidence as to the actual variation and extent of yield in the tire under observation, would they not?

A. Yes, they afford the best evidence known to me of the actual amount of the yield that takes place under the conditions of actual use in the wheel tested.

X Q. 47. Observation of a tire having a section or portion of the rubber cut away would hardly be reliable as to the actual behavior of the tire when entire, is that so?

A. I think it would be perfectly reliable, but possibly not the best test that could be devised.

X Q. 48. Taking the defendant's wheel and applying pressure by the hand against the side of the tire adjacent to the space where a section of the tire has been cut away, can you observe the rising of the sides of the tire away from the base of the channel?

A. I can't apply sufficient pressure with my hand on this wheel to say with certainty that I can see the rubber rise directly under the wire. I can see it rise very perceptibly in the space between the wire and the flange of the channel, and there seems to be a perceptible rising of the part beneath the wire, although I cannot state that I can see the base of the rubber actually leave contact with the bottom of the channel at a point directly beneath the wire. It is to be observed that this is a pretty large heavy tire with correspondingly stout wires, undoubtedly strained to practically their full safe holding strength and consequently that the action is less easily performed by manual pressure than it is on lighter wheels, such as are used on light pleasure vehicles in connection with which I have frequently made the manual tests and observed the action inquired about.

X Q. 49. It is your understanding that in the use of a rubber tire the rubber is forced into contact with the edge of the flange except in those situations where the tread portion of the tire is subjected to a lateral thrust?

A. Yes, I believe that is true of all of the tires of the prior art referred to by Mr. Wiles in this case, except the so-called cushion tires in which there are hollows or vacant spaces in the body of the tire itself, or between it and the rim to receive the displaced rubber when distorted by compression and except the tire of the Rodgers patent

and the tire of the Timberlake patent, which latter in its general organization is more like the cushion tire than like the ordinary solid tire, considered in this case.

X Q. 50. I understand from your present testimony that you cannot tell, and in fact do not know, what degree of adjustment of the wire is necessary to secure the one novel function on which I understand you distinguish the Grant patent from the older art; if I am incorrect please give such information, direction or instruction as would enable a person skilled in the art to which this invention relates, to make and practice the invention in a manner to embody and utilize this alleged novel function.

A. I do not think you have understood me correctly. All that is necessary in the way of instructions is to put the wires in as tight as you can and the tighter the better, up to a point just short of breaking the wires. This done you can't fail to get the beneficial action which I have ascribed to the construction shown and described in the Grant patent. What I do not know is simply the amount in pounds that the kinds of wire naturally used will stand without breaking, and consequently I do not know the highest safe limit in pounds that can be applied with any given wires. This knowledge is entirely unnecessary and the workmen that I have seen at various times and places applying the tires have merely strained them up by appliances operated by their muscular force until the safe limit of strength of the wire is approximately reached, they apparently having learned to recognize what strain the wires will stand much the same as a boy in tying up bundles learns about how much he can pull on the twine without breaking it.

X Q. 51. If the wires were simply threaded through the passages and their ends secured without stretching, would the Grant invention be involved?

A. As I understand what is meant by the question, no intelligent person would apply a tire in that way any more than they would use a 2-inch rubber band to hold together a one-inch bundle of papers. It would be perfectly apparent that the tire was too loose and that it would be desirable to draw the wires tightly, just as one would draw the string tightly in tying a bundle.

X Q. 52. Well, is it within the contemplation of your very general instruction as to how to use the Grant invention that the workman should stretch the wire with his hands, or with a pair of plyers or in the old fashioned way of twisting a bight of the wire around a stick and then turning the stick or should he use a wire stretcher or a traction engine or a drawing bench or some very powerful appliance for tensioning the wire?

A. It seems to me that the principal thing you would have to use was common sense and such appliances as are commonly used in applying fastening wires of this general character.

As Mr. Wiles has pointed out the use of such fastening wires merely as fastenings was quite common in the prior art relating to tires, and the manipulations necessary were generally assumed to be known, although in some cases some special way was described or suggested as a desirable one, such for example as a turn-buckle ar-

rangement screwing on to the oppositely threaded ends of the wire, and serving not only as a union but as a means for drawing the wire tight.

X Q. 53. Well then taking the formula you have given, viz., a modicum of common sense which we will assume to have been in the possession of the public even before Grant's disclosure and suitable appliances which I understand you to admit in your last answer, also belonged to the prior art, an endless retaining band or wire employed as a means for fastening rubber tires into flanged metal channels, will you please state what novel disclosure was made in the Grant patent or can be spelled or surmised from his patent, so far as the proper tension to be applied to such wire or bands is concerned?

A. As I understand the matter, there is no novel disclosure and no novelty in the Grant tire with reference to the amount of tension applied to the fastening wires.

X Q. 54. And there is nothing in the Grant patent indicating what the tension of the wire is?

A. No.

X Q. 55. And there is no suggestion in the Grant patent as to the function which you have described to his organization, viz., the raising of the tire at one edge under lateral thrust and the reseating of the tire in the channel when the pressure is removed?

A. No, there is no description in the patent of this action which takes place in the tire when constructed as shown in the patent.

X Q. 56. And finally are you able to say that that function was first embodied in the disclosure made by Grant?

A. I believe that I am. I certainly know of no example in the prior art of a tire which has the capacity for acting that way.

X Q. 57. To any extent?

A. I believe there is none that does so to any practical extent, and certainly none that does so as a part of its regular normal operation. I of course am not prepared to say that there is no prior structure in which it might sometimes possibly occur that the tire would rise from one side of the channel or rim and then reseat itself therein.

JOSEPH P. LIVERMORE.

Adjourned to Saturday, Dec. 9th, 1905, at 10 A. M.

VAN H. CARTMELL was examined as a witness on behalf of complainants in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

NEW YORK, *December 9th*, 1905.

Met pursuant to adjournment.
Present: Counsel as before.

VAN CARTMELL, a witness produced on behalf of the complainants, being first duly sworn, deposes and says in answer to interrogatories propounded by counsel for complainants, as follows:

Q. 1. State your name, age, residence and occupation?

A. Van H. Cartmell; 55; President of the Consolidated Rubber Tire Company.

Q. 2. Please state how long you have been connected with or interested in the rubber tire business?

A. Continuously since the fall of 1894.

Q. 3. Please state at what city you first located in the interests of the rubber tire business?

A. Boston.

Q. 4. What was the name of the company that you were connected with in Boston?

A. The Rubber Tire Wheel Company.

Q. 5. Please explain what the early history of the old forms of rubber tires, such as that known as the Elliott, the clincher or English tire, the Dubois rubber tire. I refer to your observations gained by your early competition with these tires.

A. As I remember it, the Dubois tire was practically out of the market at that time. I do not remember of having seen more than a sample of what is known as the Dubois tire. The Elliott tire was quite similar, as I remember it, but it had practically gone out of the market. I do not remember of having seen more than two or three tires of the Elliott pattern. The English or clincher tire was applied in Boston by Messrs. Chauncey Thomas Company, and there was quite a number in use on what might be termed heavy carriages, but their use was discontinued soon after the Grant tire was placed on the market. At that time these were practically the only tires that I remember of in Boston.

Q. 6. Referring to the Elliott tire, do you remember of any conversation with the representatives of Elliott or the parties who had been introducing this tire, in which they admitted what the trouble was with the tire?

A. I do not remember of having conversation with the representatives of the Elliott tire, but I do remember parties who had formerly purchased Elliott tires telling me that one of the greatest troubles was in the matter of application. It seemed impossible to get the tire uniformly tight, and the retaining band being anchored at one place caused the rubber to collect or bunch up at this point and finally go to pieces.

Q. 7. I hand you three samples of rubber and channel iron, and ask you if you can identify them as representing constructions that you have been familiar with or known of?

A. This tire I recognize as being of the Elliott pattern (witness refers to the exhibit marked in the Goodyear case Complainants' Exhibit "Caffrey's piece of Elliott rubber with steel tape").

This I recognize as the English or clincher type; I think I could

well say that all of the English or clincher tires are not the exact shape of this sample, but practically the same principle. (Witness refers to the exhibit marked in the Goodyear case Defendant's Exhibit Short Piece of Walker Clincher Rubber Tire.)

This I would recognize as the Dubois tire. (Witness refers to the exhibit marked in the Kokomo case Sample Dubois Clincher tire.)

Q. 8. Referring now to further history, will you please explain what early forms of rubber tires were introduced on the market in competition with your company. I would refer particularly to a tire that has been referred to in this record as the Boston tire, and also one known as the Rodgers tire.

A. As I remember it, the Rodgers tire was about the first competition we had, but this was not marketed to any extent in Boston. There were some of the tires in use in Springfield, and they were in two parts; first, a base resting in the channel, and the tire proper being in a separate piece. Rodgers' tire was finally placed on the market by Messrs. Whitman & Barnes under the name of Easy Tire. I remember very distinctly their effort to get business by very vigorous advertising, they flooded the market with printed matter and worked here in New York and Brooklyn for probably eight or ten months, and finally gave it up. The Boston tire was manufactured in Boston, as I remember it, it was first placed on the market in the fall of 1895; it was different from other tires then in the market, as it was vulcanized on to the channel, the channel was first welded in hoop form the proper size for the wheel; the rubber was then vulcanized to this channel, and the wheel then sprung into the hoop, making a very sightly and neat appearance, and gave very good service for a few months, but within a few months the rubber would separate from the metal and as soon as it started to separate, say a few inches, it was then a matter of but a few hours, if the wheel was in use, when the tire would be off. I remember very distinctly when this tire was first introduced it appealed to the carriage builder on account of the light channel and neat appearance; the method of application, however, that is the tire and channel to the wheel, was not looked upon as desirable, but inasmuch as the tire was being placed on the market by wheel builders, Messrs. Lockwood and Brown, of Amesbury, Mass., it was for a short time quite a strong competitor locally, but as I remember it Messrs. Lockwood & Brown afterward became customers of mine and replaced a large number of the Boston tires in order to satisfy their customers.

Q. 9. Referring to the exhibit Complainants' Exhibit Livermore Diagram of Rubber Tires, can you identify the drawing marked "Original Rodgers Tire" as one that you knew of and also the one marked "Whitman & Barnes Tire"?

A. I can.

Q. 10. You referred to the Rodgers tire having a separate base of rubber. I show you the drawing of Rodgers patent 539,626, and ask you if any of those figures indicate that form of tire, and if so, which one?

A. I don't recognize the Whitman & Barnes or Rodgers tire in these drawings, except what is known as the Original Rodgers tire,

or very similar. It does not seem to be quite the original tire either. As I remember the original tire it was round.

Q. 11. Comparing the cut marked "Original Rodgers Tire," and the figures of the patent, which would you say most nearly represented the tire as you knew it and have heretofore spoken of it by the name of the Rodgers tire?

A. The figures in patent, on account of its being in two pieces.

Q. 12. Referring again to the chart or Complainants' Exhibit Livermore Diagram of Rubber Tires, will you explain as to later competition that you had with reference to the sketches that are shown on this chart under the heading "After Grant." I would refer particularly to the American, the Morgan & Wright and the New England tires.

A. As I remember it one of the first competitors we had after the Rodgers tire was the Victor, and next competitor was one known as the American. At first this American concern copied the Grant pattern almost exactly; they afterwards made some changes, one that I remember particularly and which I think was the first radical change, and that being to raise the wires above the shoulder and above the periphery of the channel. This tire, as I remember it, proved a failure within a few months and the wires or holes were again placed within the periphery of the channel. Their next attempt to avoid the Grant patent was to construct the tire known as the Lip tire, in which they raised the shoulder above the channel; I remember very clearly that this tire went to pieces within a very few weeks, not to exceed three or four, in some cases, and they discontinued using it after a few months.

The New England tire was what was known as a band tire, similar to the band which was being used in the Morgan & Wright tire, except that it was much heavier and anchored at one place to the rim. While this tire may have been a slight improvement on the Elliott tire it had the serious objection of being anchored at one point. As I remember it, these tires were first placed on the market in Boston under the name of the New England tire, and afterwards by the International Automobile and Vehicle Tire Company. I am not able to say how long they were on the market, but not to exceed two years.

The Morgan & Wright tire is what is known as of the band type; this tire was originally manufactured in the West and at one time there was quite a number of them sold, first, on account of the price being low, and secondly because the method of applying was very simple, and the carriage builder supplied with this machine at a very small cost, and had the tire given satisfaction it would have, no doubt, become a formidable competitor. It met with better results than other band tires, principally I think on account of the band not being anchored to the rim, but continuous.

Q. 13. Please explain whether at the present time Morgan & Wright Company are continuing to push this band tire, or what kind of a tire they are selling?

A. This tire has gone out of use some years since, and the com-

pany who formerly manufactured it are putting on the market an imitation of the Grant tire.

Q. 14. Referring to the New England tire, I call your attention to a cut on a catalogue introduced as an exhibit in the Goodyear case, marked "Defendant's Exhibit, The Hall Combination Steel and Rubber Tire," and ask you if that describes the matter of application as you remember it?

A. It does.

Q. 15. Referring to the Livermore Diagram of Rubber Tires, particularly the part "After Grant," will you please state whether those cuts of different makes of rubber tires represent the shape of the rubber and channel iron, and indicate the fastening means in an accurate or fair manner?

A. I think they do.

Q. 16. Referring to the cut marked "Calumet" near the foot of the chart, do you remember of such a tire, and if so, what importance was it in the trade?

A. I remember this tire and the construction of the band seemed to be somewhat better than band tires which had come before it, but this method of application failed to give satisfaction and its manufacture was finally given up.

Q. 17. Do you remember the tire known as the "Wemaka" and if so was it ever fairly established in the trade?

A. I remember this tire, but do not think that it ever became what you might term established or a strong competitor.

Q. 18. Referring to the American rubber tire, I hand you a sketch entitled in the case The Rubber Tire Wheel Company vs. The Columbia Pneumatic Wagon Wheel Co., and ask you if you can state whether that cut shows the manner in which the lip or corners of the rubber were arranged with reference to the tops or outside periphery of the flanges of the channel iron?

A. As I remember it this drawing is practically the same as what was known as the American Lip Tire; it is possible that the sides may have been slightly fuller, but as to this I will not be sure.

Complainants' counsel offers in evidence the Livermore Chart and requests that same be marked Complainants' Exhibit No. 4, Livermore Diagram of Rubber Tires; also the sketch just referred to by the witness and requests that said sketch be marked Complainants' Exhibit, No. 5, American Lip Tire.

Q. 19. Do you remember as to any competitor endeavoring in recent years to sell a rubber tire with straight sides, or in other words dispensing with the formation of a corner or angle to the rubber, and using retaining wires and channel iron, and if so, explain what tire it was, who manufactured and sold it, and whether it has remained on the market?

A. There was a tire of this description known as the Langmuir tire, and was manufactured by the Revere Rubber Company, who discontinued manufacturing it probably four years since, and it has not been in the market since.

Q. 20. Please explain what change they made in the arrangement of channel iron, wires and rubber from that shown in the sketch

on the Livermore chart marked "Grant patent, No. 554,675;" and state whether there was more space between the sides of the rubber and the sides of the channel iron than that in the Grant cut?

A. I think there was no change made in the channel nor retaining-wires; the rubber was widest at the bottom; this is the principal difference between the Langmuir tire and the Grant. It being widest at the bottom it left a V-shaped space between the channel and the rubber on either side.

Defendant's counsel now objects to the deposition of this witness on the grounds, first, that it is not proper rebuttal; second, that it is not given from the witness' own knowledge, but is largely hearsay and matter of conclusion; and third, that it is in other respects irrelevant and immaterial.

Cross-examination by Mr. LINTHICUM:

X Q. 21. The Consolidated Rubber Tire Company, of which you are President, is the complainant in this suit?

A. Yes sir.

X Q. 22. How long have you been president of the company?

A. About three years.

X Q. 23. What concerns, plants or factories, does the complainant have for the manufacture of rubber tires?

A. They control the Buckeye Rubber Company of Akron, Ohio.

X Q. 24. Is that all?

A. That is the only manufacturing plant that they have, that is, where the rubber or tire is manufactured.

X Q. 25. What selling organizations does the complainant control?

A. Seven branches, if I am not mistaken.

X Q. 26. Where are they located?

A. In Boston, New York, Philadelphia, Cincinnati, St. Louis, Chicago, San Francisco and we control the Detroit Rubber Tire Company.

X Q. 27. What other concerns are there, at the present time, making and selling rubber tires like the Grant tire, aside from the Buckeye Rubber Company and your branch houses?

A. The Hartford Rubber Works Company, the Sweet Tire & Rubber Company, The Empire Rubber Company, The Republic Rubber Company, The Goodyear Tire & Rubber Company, The B. F. Goodrich Company, The Diamond Rubber Company, The Firestone Company (the defendant), The Victor Rubber Company, The Stein Tire & Rubber Company, Morgan & Wright Company, The International Vehicle and Automobile Tire & Rubber Company, The Milwaukee Rubber Company and The Kokomo Company.

X Q. 28. In other words practically all of the manufacturers of rubber tires in the country are and have been substantially ever since the decision of the Circuit Court of Appeals in the Goodyear case, making tires which you consider come within the Grant patent; is that so?

A. Yes, sir.

X Q. 29. And they are doing so at the present time without any license or other authority from the complainant?

A. I think so.

X Q. 30. While making the Grant tire, as you have stated, do not many of these manufacturers also make various other kinds, or at least, some other kinds of rubber tire having fastening other and different than that covered by the Grant patent?

Question objected to as asking for an opinion as to the construction of the Grant patent, as to which the witness has not qualified to warrant his giving an opinion, and that it is improper cross examination.

Mr. LINTHICUM: You may answer the question disregarding that portion of it which inquires whether these manufacturers are making tires coming within the Grant patent. In your answer just state whether these manufacturers are making rubber tires having a different kind of fastening from that shown in the Grant patent.

A. I don't recall any.

X Q. 31. Is it not a fact that nearly all of the manufacturers you have named or at least all of the larger ones, are making rubber tires today having outside fastenings, such as side wires, flanged clamps and the like?

A. There are tires made known as the side wire tire that are applied in a different manner from the Grant tire. This tire is being manufactured by several concerns.

X Q. 32. And it is a fact that nearly all of the heavy tires, such as used on motor cars and automobiles for commercial purposes, do not use the Grant tire? By Grant tire of course, I mean tires held upon a channel having flaring flanges by means of two independent internal retaining wires located within the periphery of the flange.

A. There is a considerable volume of business done on the class of tires described.

X Q. 33. And on all or nearly all pleasure automobiles which constitute, I suppose, the very larger part of the business, pneumatic tires of the clincher variety are used?

A. They are used in my opinion, on the large majority of pleasure automobiles.

X Q. 34. And the Grant tire never has been used on bicycles, has it?

A. Not to my knowledge.

X Q. 35. Now, on pleasure carriages of the better sort, drawn by horses, is there not a great many pneumatic tires used?

A. I think not.

X Q. 36. Would it not be fair to say that the Grant tire is confined in use today chiefly to cabs and carriages used for commercial and pleasure purposes?

A. I think so.

X Q. 37. You do not contend that the Grant tire discloses the only practicable and reliable construction for securing rubber tires to vehicles, do you?

A. Of the tires coming under the Grant design or patent I am of

the opinion that the Grant device for applying the tire is the most satisfactory; in other types of tire, namely, the pneumatic and the endless automobile tire, there are other devices that seem quite successful.

X Q. 38. And would you not say that for a tire for the wheel offered in evidence as Complainants' Exhibit, No. 3, Defendants' Wheel and Tire, that the side wire tire originally applied to this exhibit was as good or a better fastening than the one now on that tire; by the side wire fastening I mean the fastening that was originally applied to that wheel by the defendant when the complainant caused the wheel to be sent to defendant's shop to have a tire applied without any instruction as to what kind of a tire should be applied?

A. I think it was as good. I couldn't say it was better.

X Q. 39. The chief advantage of the Grant tire resides in the fact that it is well suited to vehicles having wheels with narrow treads, is it not?

A. I think they are particularly successful on wheels of this kind.

X Q. 40. And it is in that class of wheels where the Grant tire has found its principal market; that is, I mean among the smaller sizes running from ⅝ to an inch and three-quarters?

A. I am satisfied that the bulk of the trade has been in those sizes, until the past two or three years the solid tires were confined almost to wheels below two inches, and the larger sizes are coming into use with automobiles.

X Q. 41. Now when the complainant applies larger sizes, say three inches and over, it does not rely on the two wire fastening, such as shown in the Grant patent; is that so?

A. They increase the number of wires.

X Q. 42. And change the section of the channel and rubber?

A. We have not changed the section of channel nor the base of the rubber.

X Q. 43. But you do change the section of the exposed part of the rubber?

A. Yes.

X Q. 44. And do you add any other means of holding the tire in place except to increase the number of wires?

A. We add no other means unless in some instances in applying large tires we may shellac the channel.

X Q. 45. Does not the complainant in this case make and apply solid rubber tires which do not come within your understanding of the Grant patent?

A. We do of an endless type.

X Q. 46. That is where the tire is an annulus of rubber?

A. Yes.

X Q. 47. Since your acquaintance with the rubber tire business have you known of the failure of any rubber tire concern aside from those you have mentioned in your direct examination?

A. In answering this I wish to call attention to the fact that in my direct examination I did not mean that the concerns referred to failed in a financial sense; what I meant to say was that the tires proved a failure and they passed out of the market as competitors, and I know of other tires not mentioned in the direct examination.

X Q. 48. The point about which I wish to inquire is this: Do you know of any failures in business or of the failure of business ventures in placing tires upon the market aside from those you have mentioned and particularly where you could not attribute the failure to the kind of tire that was put out?

A. I am not able to say that I can now recall a failure.

X Q. 49. Why did the Lip tire, shown in your exhibit, Sketch No. 5, fail?

A. It is simply my opinion that the construction was bad, and that the failure of the tire to give satisfaction was on account of the shoulder being above the channel.

X Q. 50. What is the average life of a Grant tire, such as is used on a cab or hansom in the city of New York?

A. On what is termed a hansom cab in public service I would say that the average life of a tire is between 12 and 15 months. If the cab is used, as some of them are, night and day, the average life may not exceed 12 months. On four wheel cabs the front wheels average about 12 months and the rear wheels 15 to 18 months.

X Q. 51. And is it not a fact that the tires are dislodged or ruptured or have to be repaired or replaced sometimes within a much shorter period?

A. Sometimes. In my former answer I tried to give the average.

X Q. 52. Is the Grant tire cheaper or more expensive than the tires mentioned in your direct testimony, and which I believe you referred to as the Elliott, the Rodgers and the English clincher?

A. I do not think there would be a material difference in cost if made of the same compound.

X Q. 53. Is not the Grant tire cheaper to construct than any band tire known to you?

A. I do not think there would be any material difference, unless in the difference in the cost of the compound.

X Q. 54. Now for equal strength is it not a fact that two independent retaining wires would be cheaper than a steel band or tape?

A. I should think the cost would depend on the quality of steel used in them.

X Q. 55. And the strength would depend on the quality of the steel?

A. And difference in size.

X Q. 56. Now what I want to know is this: A steel band to give a given strength must be of a certain quality of steel and of a certain width and thickness, I assume; what I wish to know is whether to get the same strength a band would not be more expensive than a fastening in the form of two independent retaining wires?

A. I can't answer this.

X Q. 57. The Grant tire would be cheaper to apply than a tire like the Elliott, the Rodgers or the English clincher?

A. I don't know that it would.

X Q. 58. Are the rubber compounds of the Grant tire the same as those used in the Elliott, Rodgers and English clincher?

A. I don't know.

X Q. 59. In what stage was the industry of rubber tires for vehicles when you became connected with the business?

A. It was in its infancy in the states.

X Q. 60. Is it not a fact that the use of pleasure vehicles and the improvement of those vehicles with regard to comfort and luxury has enormously increased during the last ten years?

A. My observation is that there are better and more carriages, pleasure vehicles, being used every year.

VAN H. CARTMELL.

A. S. KROTZ was examined as a witness on behalf of complainants in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

A. S. KROTZ, a witness produced on behalf of complainants, who having been first duly sworn, deposes and says in answer to interrogatories propounded by counsel for complainants, as follows:

Q. 1. State your name, age, residence and occupation?

A. Alvaro S. Krotz, age 40, residence, Springfield, Ohio; occupation manufacturing.

Q. 2. Please state what your present occupation is?

A. Manager of the Krotz Manufacturing Company. We manufacture tire setting machinery, automobiles and automobile parts.

Q. 3. Have you had experience in the rubber tire industry and if so, how long and in what capacity?

A. I was employed by the Rubber Tire Wheel Company in the fall of 1897, and my duties were principally with the tire setting department in building and installing necessary apparatus for such work.

Q. 4. Indicate in a general way what mechanical experience you have had that would enable you to testify as to matters pertaining to mechanics?

A. I have followed mechanical pursuits for twenty years, and during that time my work has been devoted almost exclusively to installing, testing or designing mechanical devices of various sorts, covering steam engineering, electrical engineering.

Q. 5. While you were connected with the Rubber Tire Wheel Company did you have any practical experience with the matter of applying rubber tires to vehicle wheels; and if so, explain in a general way what experience you had.

A. My duties covered installing plants with new customers and instructing the men in the operation of the machinery and the proper application of the tire to the wheel; these duties required on two different occasions trips to European cities, and I was looked to to see that all men were properly instructed and all tires were properly applied, to make any improvements that might suggest themselves.

Q. 6. From your experience in supervising the application of rubber tires of the Rubber Tire Wheel Company make to vehicle wheels, please state whether or not it is necessary, in order to obtain what is known as the tipping or lateral movement of the tire in actual use, to fasten the wires with that particular purpose in view? Or, in other words, whether or not the lateral movement depends entirely on the degree of tightness with which the wires are fastened; and in answering you may explain fully any reason you have for any opinions that you express.

A. It does not. It was my custom to instruct the men to draw the wires as tight as possible; that the only limit or matter to be safeguarded against was the breaking of the wires. For further proof in this I have recently made a series of tests upon tires which had been applied in the usual way, and with the wires drawn as tightly as possible, and each of these tests showed the tipping of the rubber and lifting of the wire. The first test was made on a surrey from a livery stable owned by a Mr. Foster, in Springfield, Ohio. This first test was made September 16th, 1905, and upon the tire which was found on the wheel and had been in use some time; without removing the tire or interfering with it in any way a connection was made to the rubber at one side to a needle, the point of the needle adapted to scratch upon the face of a piece of glass and thereby indicate any lateral movement of the rubber, on the glass. On drawing, sheet No. 1, Figs. 1 and 2, represent this connection or attachment, and the wheel I have before me is the wheel upon which this test was made (the witness refers to a sketch to be marked Complainants' Exhibit 6, Sketch 1, and the wheel will be marked Complainants' Exhibit 7, Foster Wheel.)

Referring to Exhibit 6, Sketch 1, Figs. 1 and 2, *c* represents the needle, *a* represents the tire retaining-wire, *b* represents the connection between the rubber and the needle, *d* represents the frame upon which the glass *d*2 was held by the metal plate *d*1; the needle *c* was held from turning by a cross bar *c*1, and passed through a hole in the journal *c*2, the spring *c*3 was provided to hold the needle against lost motion in the journal *c*2; a short section of the flange of the channel was removed so as to give the pin *b* freedom to move with the rubber. Photograph marked No. 1 is of the surrey on which the test was made, and Photograph No. 3 represents the street and the car track over which the carriage was driven; the print marked No. 1 on card No. 1 represents the result of this test—this print appears at the upper right hand corner of the card and is recognized by the witness by his initials and the date which was put on the glass immediately after the test was made. The marks indicate a considerable lifting or tipping of the rubber.

After this test was made the vehicle was driven to a carriage building establishment operated by Kuqua & Son, and a new Kelley tire was purchased and their rubber man instructed to remove the old tire which was apparently a Victor tire, and place in its stead the new tire fitting it on as tight as possible, without changing the channel, which I presume was a Victor product also. This change was made in the presence of the witness, and it was apparent that

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Complainant's Ex. 6 Sketch No. 1

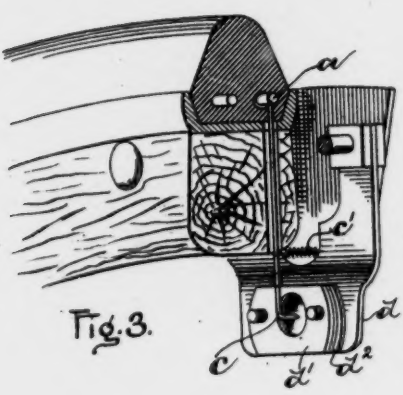


Fig. 3.

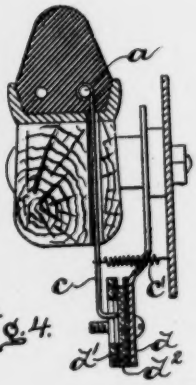


Fig. 4.

Fig. 1.

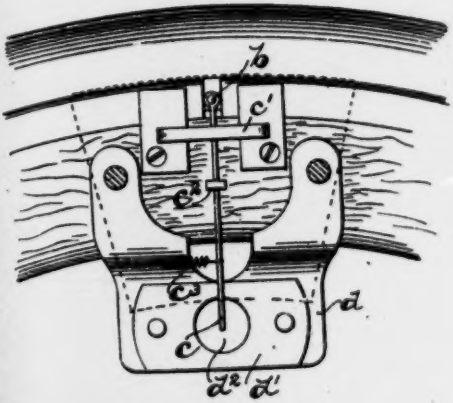
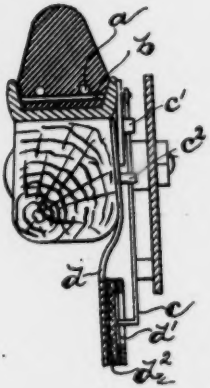


Fig. 2.



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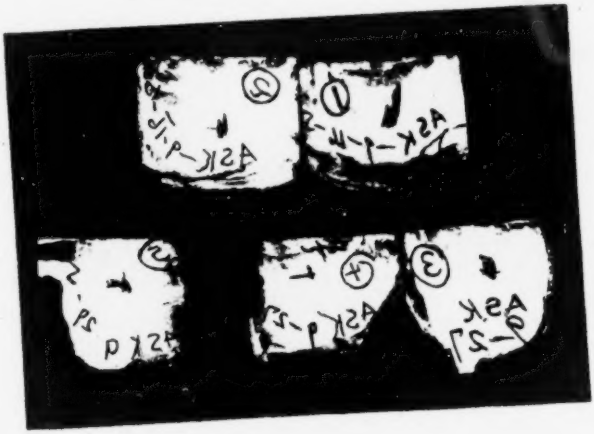
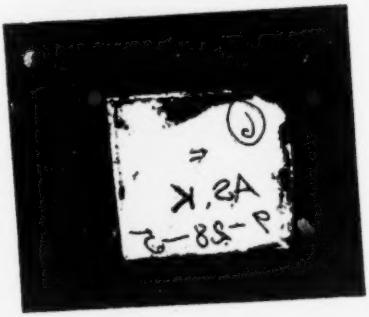
Complainants' Exhibit No. 8, Card No. 1

(Tests Nos. 1, 2, 3, 4 and 5)



Complainants' Exhibit No. 8, Card No. 2

(Test No. 6)



the retaining bands were drawn very tight. Another test was made by driving about ten minutes over the same route, and the print No. 2 at the upper left hand corner of card No. 1 represents the result of this test. Before and after the test, but while the glass was still in the holder, the needle was swung horizontally so as to indicate a neutral position; this is clearly indicated by the horizontal line on the print, and the print indicates a considerable tipping of the rubber.

(Recess to 2 p. m.)

On September 27th a direct connection was made to one of the band wires as shown in Fig. 3 on sheet 1. This attachment is practically the same as the one just described, except that the needle passes up through a hole in the felly and channel, and is attached direct to the wire, as indicated. In this attachment the needle *e* is held against the glass by a spring *e*1; the vehicle was driven over the same route as before for about ten minutes, and the result of this test is indicated by print 3 at the lower right hand corner of card No. 1, and is recognized by the witness by the initials and date; the horizontal line on this print indicates a considerable tipping of the rubber. Directly after this test another glass was placed in the holder and a horizontal line made by swinging the needle, and the vehicle driven carefully several blocks and return, during which time no effort was made to tip the rubber by driving over tracks or against the curbing. The distance covered was on a paved street, and before removing the glass, the needle was again swung in a horizontal position and the print No. 4 indicates this test.

The print 5 indicates the next test at the same time made directly after test 4; the conditions were the same except the horse was driven rapidly over the course and across street car tracks and gutters and against curbing. The top of this print points to the left; the horizontal line is clearly indicated and was made before and after the test.

On September 28th a coated glass was placed in the holder and while the rubber was in its normal condition a horizontal line was made by swinging the needle; a clamp was then placed on the wheel directly over the point where the needle was fastened to the wire, and the rubber compressed or pressed against the channel, and while in this condition the needle was again swung horizontally, the print on card No. 2 clearly indicates the result, namely, the wire was depressed or moved toward the bottom of the channel over one-sixteenth of an inch.

Tests Nos. 1, 2, 3, 4 and 5 indicate this same movement, as in each case there are marks below the horizontal line. This test No. 6 was made in the presence of Mr. Walker, a draftsman in the office of the Krotz Manufacturing Company.

On October 12th an indicating device, as shown on sheet No. 2, Figs. 1 and 2, was attached to the retaining wires of the same tire. This apparatus is now on the Foster wheel, Exhibit 7, except that the protecting plates *xx* are removed and the plate *d*1, which held the glass in place, is also removed. In referring to the other tests I

failed to mention the fact that pieces of cardboard were supplied between the glass and the metal on either side, so as to prevent breaking of the glass. Four tests were made with this device on this date. In placing the glass in position for test No. 7, a neutral line was not made, but after the test and before removing the glass it was pushed up and toward the tire with the needle against the glass, so as to mark a neutral point. On test No. 8 before making the test and in placing the glass in position, the neutral line was made. For both of these tests the opposite wheel was driven against the curb. Print No. 9 indicates a test in which the neutral line was made before and after, and the carriage wheels were not driven against obstructions, merely driving on a walk three or four squares and turning several times, at one time cramping the wheel slightly.

The next test, No. 10 was made with Mr. Hiser as a witness. The neutral line being made before and after the test, and the opposite wheel was driven against the curbing. Mr. Hiser noted the movement of the pointer at every revolution of the wheel, assisted in placing the glass in position and removing it, and signed his initials to the glass after the test, and the witness now identifies a reproduction of these test glasses as indicated on card No. 3 by his initials and the dates marked thereon.

After test No. 9 was made, and before the glass was removed, the vehicle was driven to Kuqua & Son's establishment and the man that applied the tire inspected the rubber and wheel. Between test No. 2 and test No. 10 the tire had not been disturbed, except to cut it and part it enough to make the needle connections to the wires. On November 22d the witness received the wheel marked Exhibit No. 3, Def't's rubber tired wheel or Firestone wheel and applied the device which is now on the wheel referred to. This wheel was placed on an automobile owned by the witness and a painted glass placed in the holder and the automobile was driven for about twenty minutes, part of the time over the track shown in photograph No. 3 and on a paved street, the vehicle being turned quickly and driven zig-zag across the track. The result of this test is indicated by card No. 4, and the reproduction is identified by the signature of the witness. Another test was made directly afterwards with Mr. Hiser as a witness, and the vehicle driven over the same territory, and the result of this test is indicated by card No. 5, and the reproduction is identified by the initials and the date thereon. Mr. Hiser also signed this card for the purpose of identification, and assisted in placing and removing the glass. In these last two tests the pointer was swung horizontally before and after making the test, and the witness identifies the wheel as the one in evidence, and the apparatus attached as it was when the tests were made.

The test on card No. 5 indicates a slight change of the horizontal line or neutral position, and the witness wishing to ascertain the cause parted the rubber where the needle is fastened to the wire and found that the wire had traveled during the tests, bending the needle against the edge of the channel and lifting it. This movement of the wire no doubt occurred during the last test as the vehicle was driven harder and the test more severe.

Complainant's Ex. 6 Sketch No. 2

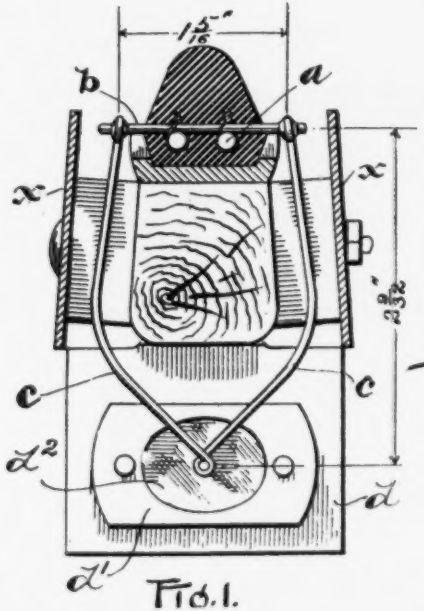


Fig. 1.

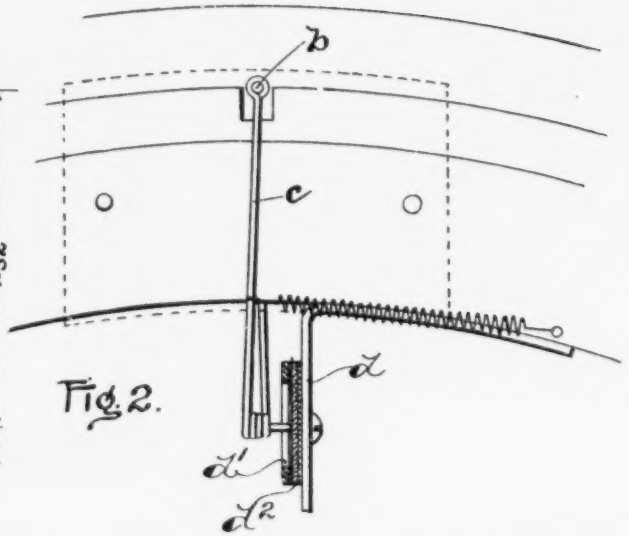


Fig. 2.

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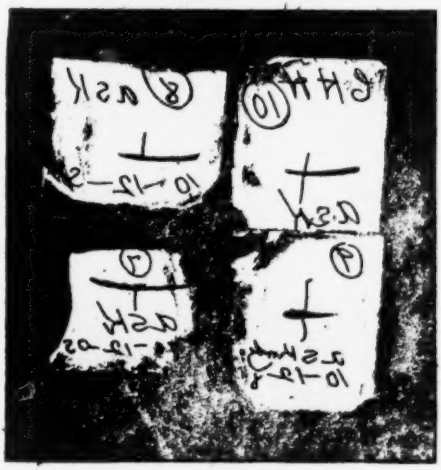
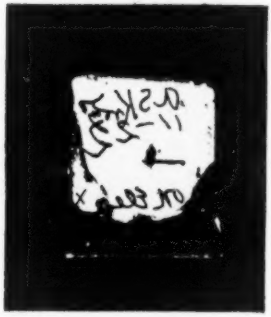
Complainants' Exhibit No. 8, Card No. 3

(Tests Nos. 7, 8, 9 and 10)



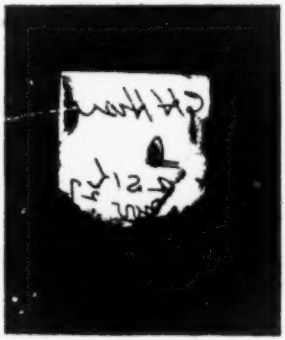
Complainants' Exhibit No. 8, Card No. 4

(Test No. 11)



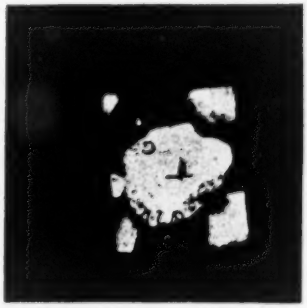
Complainants' Exhibit No. 8, Card No. 5

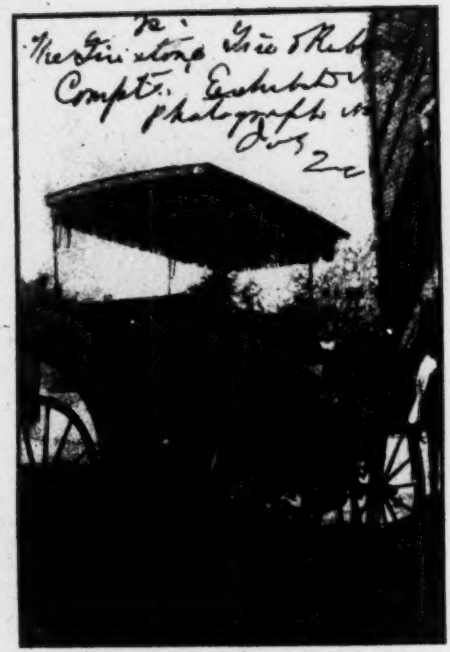
(Test No. 12)



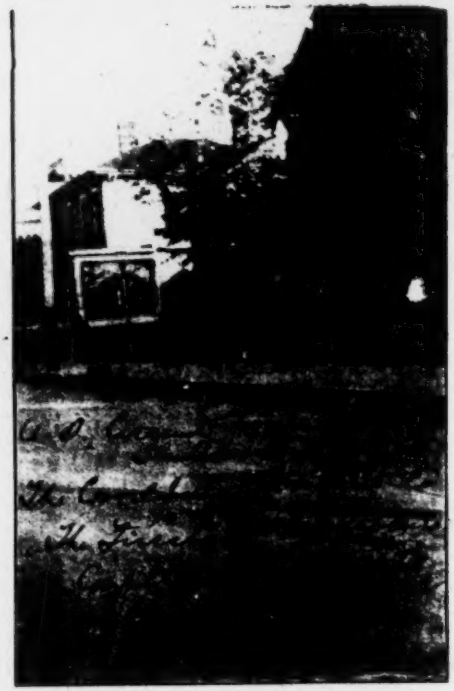
Complainants' Exhibit No. 8, Card No. 6

(Test No. 13)





Complainants' Exhibit No. 10, Photo. No. 1



Complainants' Exhibit No. 10, Photo. No. 2

Complainants' Exhibit No. 10, Photograph No. 3

On December 8th the witness assisted Mr. Cooper at 1784 Broadway, New York City, in placing the indicating apparatus on a wagon wheel, Complainants' Exhibit No. 8, Wheel with Complainants' Tire, which is now identified by the witness by his signature in pencil on the rim and other signs; the result of this test is indicated on card No. 6. The needle was moved in horizontal position both before and after the test, and without disturbing the glass. The glass on card No. 6 is identified by the witness by marks made on the glass and the test was made by driving the opposite wheel against the curbing a number of times. The vehicle was partly loaded at the time of the test. All of the tests made by the witness indicate clearly the tipping movement of the rubber and a lifting of the wire, and a slight depressing of the wire. They also indicate a longitudinal movement of the wire. Mr. Cooper applied the rubber to Exhibit wheel No. 8 in the presence of the witness and was instructed by the witness to make the bands as tight as was possible to make them, and during the process of applying this tire two sets of bands snapped or broke at the weld after the wires were released from the jaws, and it was evident that the bands were as tight as it was practical to make them.

Q. 6. Mr. Joseph P. Livermore has referred to a test being made in his presence. Were you present at the time that test was made, and did it conform to these tests you have referred to?

A. On November 17th Mr. Livermore and the witness made the tests with the Foster wheel, and in the same manner that the other tests were made, and with the same results.

Q. 7. From your experience what would you say as to the rubber tire on the Foster wheel being as tight as is usually fastened with rubber tires of that size?

A. I would consider the bands tighter than the usual run.

Q. 8. In 1896 were you familiar with the method employed of getting the tires on the wheel used generally, and if so, state what it was?

A. I was not familiar with the method at that time, but became familiar with it in 1897, and replaced machines that had been installed in 1896. The usual method at that time was to fasten the wires forming an endless band of the rubber and jumping it into the channel with levers or paddles.

(Direct examination closed.)

Cross-examination by Mr. LINTHICUM:

Defendant's counsel objects to the deposition of this witness as irrelevant and immaterial because it relates to nothing shown, described or claimed in the Grant patent in suit, or suggested thereby; further, because the results of the tests made by the witness are not the result of anything disclosed or claimed or suggested in the Grant patent; further, because the tests made by the witness were entirely ex parte, defendant's counsel having had no notice or knowledge as to the character of the said tests nor as to when they were to be made and no invitation to witness them; further, because the tests are themselves irrelevant, indefinite and insufficient in that they

do not represent nor do they purport to represent actual conditions of service, but were artificial and represent abnormal conditions; the testimony of the witness as to some party named Hiser and what he said and what he saw is objected to as hearsay and the various exhibits produced and submitted by the witness are objected to as wholly indefinite, conveying no intelligent meaning of any result attained or supposed to be attained; and the cutting of the tire and wheel, Complainants' Exhibit No. 3, Defendant's Rubber Tire Wheel is objected to as unwarranted and the test thereof wholly inconclusive, because the wheel when originally offered in evidence had portions of the rubber removed down to the wires and for the purpose of this test the whole of the rubber in cross section at one point appears to be removed and no removement of the wire as indicated by the pointer has therefore any evidential value whatsoever, and defendant's counsel declines to cross examine as to this irrelevant, incompetent and jumbled mass of statements, pictures and apparatus referring to these ex parte tests.

Counsel for complainants states that in order to reproduce the impression made by the needle on the glass on Card No. 6, by consent of defendant's counsel he will have prints made of said impression on the glass, and the same will be used in the record instead of the original.

CLINTON H. COOPER was examined as a witness on behalf of complainants in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

Thereupon CLINTON H. COOPER, a witness produced on behalf of complainant, having been first duly sworn, deposes and says in answer to interrogatories propounded by counsel for complainants, as follows:

Q. 1. State your name, age, residence and occupation?

A. Clinton H. Cooper; age, 35; residence, 504 West 147th Street, New York; occupation, rubber tire business.

Q. 2. What company are you employed with at the present time?

A. Consolidated Rubber Tire Co.

Q. 4. In what capacity are you employed?

A. I put on the rubber tires.

Q. 5. How long have you been engaged in the business of putting on rubber tires?

A. Nine years and a half.

Q. 6. Do you know what is meant by the tipping or lateral movement of the rubber tire known as the Kelly rubber tire?

A. I do.

Q. 7. Please explain what you understand is meant?

A. The tire under a certain strain will raise up one side.

Q. 8. After the strain is removed, what happens?

A. It goes back to where it was originally.

Q. 9. Do I understand that you have been almost continuously employed in putting rubber tires employing the retaining wires as fastening means?

A. I have.

Q. 10. Please state whether or not you have found from your experience that the tipping or lateral movement is dependent upon the wires being fastened with that object in view or whether this tipping movement is independent of the degree of tightness with which the wires are fastened? You may, in answering this question, explain what your experience has taught you.

A. I always make it a point to put on the tire as tight as the wires will allow, and I find there is a tipping or lateral motion on every tire.

Q. 11. From your experience, what is the fact as to the breaking of wires in fastening these rubber tires on the wheels—whether it ever occurs or not?

A. Quite often I break wires putting on the tires, that is, drawing it so tight I pull the wires in two, trying to get the tires on as tight as possible.

Q. 12. State whether or not it is a fact that in putting on these rubber tires you learn that there is a point of danger past which you aim not to go?

A. By drawing the wires up, I found by experience that when you get the full tension of the wire, if you tighten any further the wires will break, so when I get to that certain strain I generally stop so as not to break the wires.

Q. 13. Please examine the wheel which is present here in this room, and state whether you recognize it, or can identify it as a wheel that you have seen before?

A. I can.

Q. 14. Please explain what you know as to that wheel, and the rubber tire that is on it?

A. I have put the rubber tire on that wheel just as tight as the wires would stand.

Q. 15. When did you do this?

A. December 8th, 1905.

Q. 16. After this rubber tire was put on the wheel, what was then done with the wheel?

A. It was put on the wagon and used.

Q. 17. Explain fully what use was made of the wagon, and whether there was any means of determining whether the rubber tire in use had any tipping or lateral movement?

A. We put it on the rig and we drove it and found out that the tire tipped.

Q. 18. Do you remember whether there was put in that rig any load, or anything to constitute a load?

A. I should judge about a thousand pounds of iron.

Q. 19. Would you say that the wagon was over-loaded at all, considering its size or construction?

A. It was not.

Q. 20. Please explain whether the wheel here, or any other wheel

on the wagon or rig was subjected to any obstacles or obstructions that would produce any strain against the wheel?

A. Not any more than it would be liable to get in ordinary use.

Q. 21. State just what was done, as you remember?

A. The wagon was drove so the wheels rubbed up against the curbstone.

Q. 22. Did the wheel having the indicating mechanism as shown here slide on the road, or skid along, and if so what kind of road was it driven on?

A. The wheels slid or skidded along on the pavement, a cobble pavement.

Q. 23. Was the horse driven out of a walk, or not?

A. It was not.

Q. 24. How long was the wheel subjected to these strains due to being slid or skidded over the cobble pavement?

A. I should judge about fifteen minutes.

Q. 25. I hand you a card marked "Card No. 6" with a piece of glass glued thereon, and ask you to state if you recognize that, and is so state what it is?

A. I recognize it as the glass we had in the mechanism on the wheel.

Q. 26. Did you mark that glass in any way?

A. I did. I put my initials on it at the top, and before we put the wheel on the wagon I moved the pointer crossways.

Q 27. Do you know whether anyone else put any marks on the glass in the shape of initials?

A. Mr. Krotz put his initials on.

Q. 28. Before this wheel was run on the pavement, and after the glass was put in the plate-holder, did you notice carefully whether there were any marks on the glass, other than the cross-mark that you have referred to?

A. I noticed the glass very carefully, and there was no other mark on it.

Q. 29. What is that black substance that appears on the glass?

A. India ink.

Q. 30. After the rig had been run on the streets, as heretofore explained, do you know whether the needle or pointer could have made any mark while the glass was being removed from the plate-holder?

A. It could not possibly.

Q. 31. Explain why?

A. The pointer was held firmly away from the glass while it was being removed.

Q. 32. Before the glass was removed, could you see that any mark had been made by the vertical movement of the needle?

A. Yes, sir.

Q. 33. Do you remember when you looked at it, as to whether it was before or after the rig was driven back to your place of business?

A. I looked at it before and afterwards.

Q. 34. Did you look at it after the wheel had been subjected to strains and before the rig had been driven back to the stable?

A. I did.

CLINTON H. COOPER.

Complainants' counsel asks that the Examiner mark the wheel referred to "Complainants' Exhibit No. 9, Wheel with Complainants' Tire," and the card with the glass secured thereto "Complainants' Exhibit No. 8, Card No. 6."

(Direct examination closed.)

The exhibits just offered in evidence are objected to as irrelevant and immaterial, and the testimony and the exhibits are objected to as not relating to anything shown or described in the Grant Patent, and there is no cross-examination, and the objection made to the testimony of the witness Livermore as to these tests, on the ground that they were ex parte, is repeated.

Complainants' counsel states that complainants will very willingly afford counsel for defendant an opportunity to witness a repetition of the test or experiment referred to, if counsel for defendant will within a reasonable time give complainants notice that he desires to witness a repetition of the same.

Defendant's counsel says that this offer is idle. If there was any desire that the test should be inter partes, notice should have been given before they were made. Defendant's counsel was in New York on this case at the time they were made, and knew nothing about them, the first information coming from Mr. Livermore that he had seen certain tests. Now it appears that this tire was applied on the 8th of December, and the test as to this alleged tipping was made while defendant's counsel was attending on this testimony. A repetition of the test would obviously afford no basis for cross examination of this witness.

Counsel for the complainants refers to the fact of record that the defendant's counsel, Mr. Linthicum, has been extremely busy and hard to get hold of, that he was not able to be present at the beginning of this session, and devoted yesterday, being the day when the test was made here in New York, to the cross examination of complainants' expert, Mr. Livermore, but complainants' counsel remembers distinctly of explaining to Mr. Linthicum in Chicago some weeks ago that tests would be made or had been made and testimony would be introduced as to such tests, but complainants' counsel cannot remember that he did explain just what these tests would be, and did not invite defendant's counsel to be present.

It is stipulated, subject to defendant's objections as to relevancy, etc., that Charles McConnell, residing at Boston, Massachusetts, employed by the Consolidated Rubber Tire Company in the capacity of a mechanic, and for years experienced in applying the Kelly rubber tires to wheels, would, if present, testify as to the requisite tightness and effect in applying rubber tires to vehicles the same as the preceding witness, excepting that the said witness has made no tests with indicating mechanism as explained by the preceding witness.

Adjourned to meet Monday, December 11th, 1905, at 10 o'clock, for the purpose of allowing complainants' counsel to introduce the various exhibits referred to during the taking of this testimony and such other matters from the records covered by the stipulation in

this case, it being understood that defendant's counsel enters the same objection to the test apparatus and exhibits as noted to the testimony of the witnesses.

United States Circuit Court, Southern District of New York.

THE CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,
vs.
FIRESTONE TIRE AND RUBBER COMPANY, Defendants.

Stipulation.

CHICAGO, ILLINOIS, *June* 20, 1905.

Present: John R. Bennett, Esq., counsel for complainants; and Charles C. Linthicum, Esq., counsel for defendant.

Defendant's counsel admits the incorporation of the complainant companies as alleged in the bill of complaint and waives proof of the execution of the two instruments heretofore offered in evidence and marked "Complainants' Exhibit No. 2 Complainants' Title Papers."

Defendant's counsel also admits that the defendant has a regular and established place of business in the City of New York, in the Southern District of New York, for applying rubber tires to wheels; and that the wheel heretofore offered in evidence and marked "Complainants' Exhibit No. 3 Defendant's Rubber Tire Wheel" was sent to the defendant at its said regular and established place of business in the said City of New York, accompanied with a request to have a rubber tire applied thereto; and that thereupon the defendant applied to the said wheel what is known as its side wire rubber tire; and that said wheel was afterwards returned to it with the statement that an internal wire rubber tire was what was wanted in order to have the wheel match the other wheels of the set; whereupon the defendant removed the referred to side wire rubber tire and applied to the wheel the internal wire rubber tire which is now upon it, and for which it was duly paid; and it is further admitted that the defendant has been in the habit, at its said regular and established place of business in the city of New York, in the ordinary course of its business there, of applying to wheels such internal wire rubber tires as is now upon the referred to exhibit wheel; and that it did so apply such internal wire rubber tires to wheels in the ordinary course of its business during the period of several months prior to the filing of the bill of complaint herein.

It is stipulated by and between the parties hereto, through their respective counsel, that a printed copy of the transcript of the record on appeal in the case of these complainants against the Goodyear Tire and Rubber Company, et al., in the Circuit Court of Appeals for the Sixth Circuit shall be treated as a part of the record herein, such printed copy to be marked herein as "Exhibit Transcript of the Appeal Record in the Appeal of the Complainant vs. the Goodyear Tire Rubber Company, in the Circuit Court of Appeals for the Sixth Circuit;" and that the complainants' part of said record shall

Clarke No. 4926 of 1884.

Phillips No. 6833 of 1890.

Fig. 2 Fig. 1

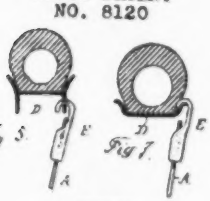
Woodward, No. 443,735 of 1890.

Fig. 3.

Myers, No. 488,971 of 1892

Fig. 3.

EVERETT
SWISS PATENT
NO. 8120

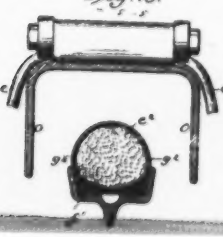


Crowther, No. 9008, of 18

Fig. 3.

KELLEY
U. S. PATENT
321,819

Fig. 10.



PRIOR ART

Owen, No. 365,091, of 1887.

Fig 6.

Keerie, No. 91,435, of 1869.

Fig 4.

Kelley, No. 362,514 of 1887.

Fig 5

Denton, No. 14,618, of 1890.

Fig 1.

1908, of '32.

WOODWARD
U. S. PATENT
No. 481,340.

Fig 3

Coops # 20678
(design)

Kearsley, No. 1352 of 1883

Fig 1. Fig 2.

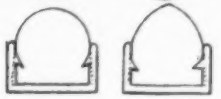


Fig 3 Fig 4.

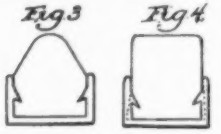


Fig 5. Fig 6.

Beersmith No 424,462 of 1890

Fig 1.

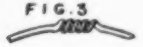
Hutchinson, No 21,341 of 1898.

Fig 2.

Hillenghby No 393,4 of 1892.

FIG. 8a.

FIG. 3



Otto, No 358,291, of 1887.

Fig 5 Fig 1.

LATTA U. S. PATENT NO. 341,611

Fig 1

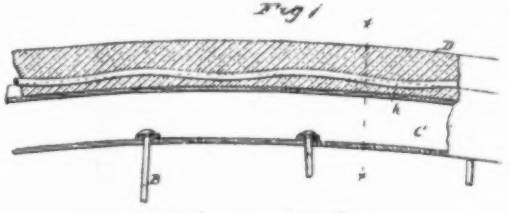
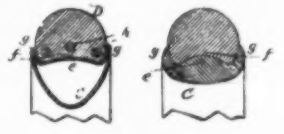


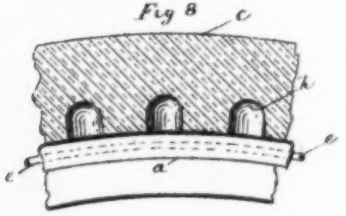
Fig 5 Fig 6



WELCH
BRITISH PATENT
No. 14,563/90

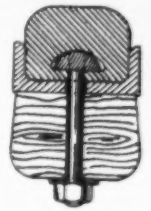
Fig 1

Fig 8



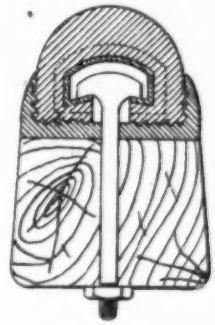
Kenner, No 23,931 of '93.

Fig 2



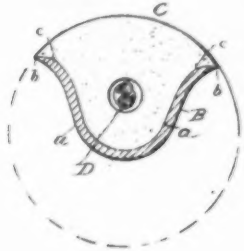
Picard, No 11,707 of '95

Fig 1



GRANT & JEFFERIES
U. S. PATENT
No. 470,483

Fig 5



Walker

Greene, No

Fig

Timberlake

Fig 3.

Hoffman, No

Fig 2.

Rodgers, No 33

Fig 6. Fig 7.

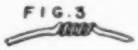
Claypool, No

Fig 5.

Hilloughby No. 5324 of 1892.

FIG. 8a.

FIG. 3



Otto, No. 356,291, of 1887.

Fig 5 Fig 4.

LATTA U. S. PATENT NO. 341,811

Fig 1

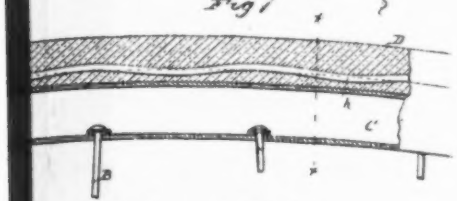


Fig 5 Fig 6

WELCH
BRITISH PATENT
No. 14,563/90

Fig 1

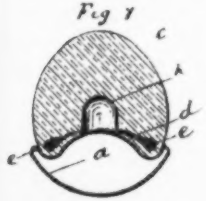
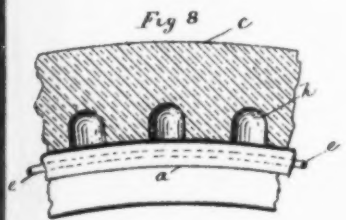
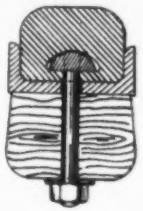


Fig 8



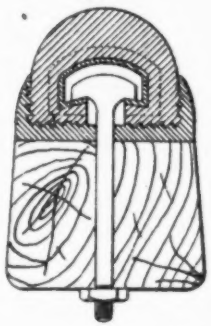
Kenier, No 23491 of '92.

Fig 2



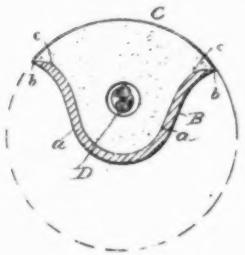
Picard, No 11,707 of '95

Fig 1



GRANT & JEFFERIES
U. S. PATENT
No. 470,483

Fig 5



Walker No 3302 of '77.

Greene, No 162,100 of '75.

Fig 2.

Timberlake No 20,706 of '90.

Fig 3. Fig 6

Hoffman No 7901 of '90

Fig 2. Fig 3.

Rodgers, No 533,826 of '95.

Fig 6. Fig 7. Fig 8.

Claypool, No 431,223 of '90.

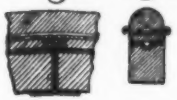
Fig 5. Fig 8.

Elliott, No 440,702 of '90

Fig 2

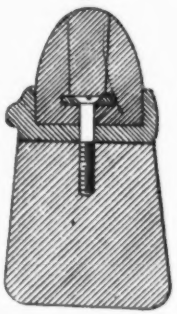
Elliott, No 440,702 of '90

Fig 1 Fig 2.



Beale, No 11,329 of '88

Fig 4.



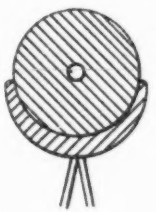
Lyon, No 416,981 of '90

Fig 1.

Hillenghby, No 18,030 of '92

Fig 30.

ORIGINAL RODGERS TIRE.



Grant's

Grant's

DEFENDA

Deft's

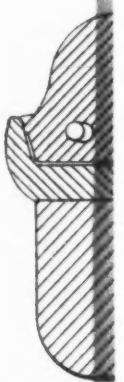


Fig 2

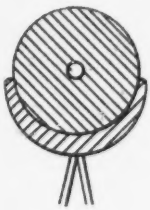
Fig 1 Fig 2.

Lyon.
No 418,962 of 90
Fig 1.

Fig 4.

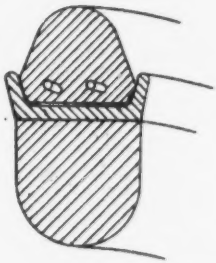
Killoughby.
No 18050. of 92
Fig 30.

ORIGINAL RODGERS TIRE.



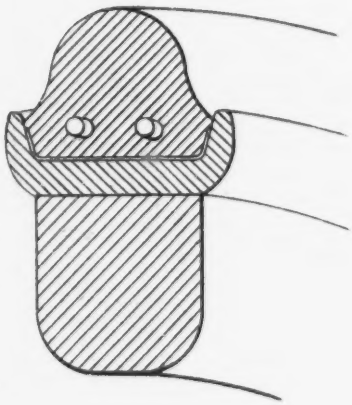
Grant's Invention 1894

Grant Pat. No 554675



DEFENDANT'S EXHIBIT No. 3

Deft's Rubber Tired Wheel.



AFTER GRANT

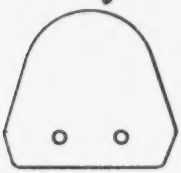
Kokomo

Goodyear V shaped

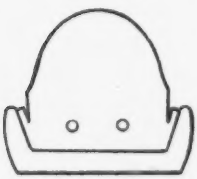
Victor

Hartford

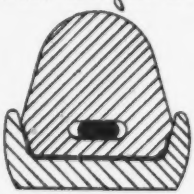
Firestone-Victor
Kelley-Maus
Imperial



Goodyear Wing Tire
in Channel.



Compts Ex
New England Tire

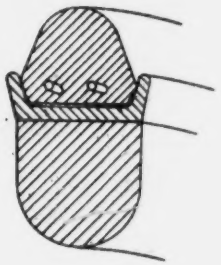


Compts.' Ex.
Piece of
Morgan & Wright
TWO-WIRED TIRE.

Compts.' Ex.
Piece of
International
TWO-WIRED TIRE.

Grant's Invention 1894

Grant Pat. No 554675



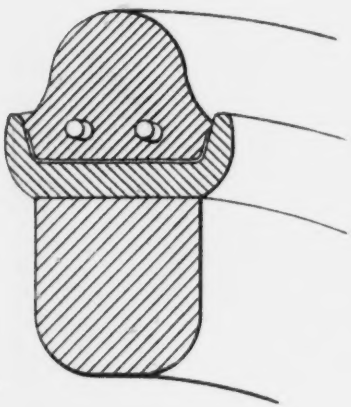
Lyon.
No. 8,982 of 30
Fig 1.

Willoughby.
No. 18,030. of 92
Fig 30.

NAL RODGERS TIRE.

DEFENDANT'S EXHIBIT No. 3

Deft's Rubber Tired Wheel.



AFTER GRANT

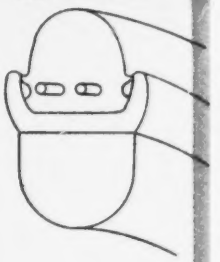
Kokomo

Goodyear V shaped

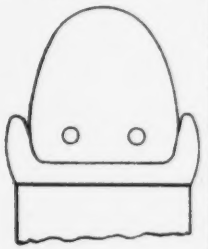
Victor

Hartford

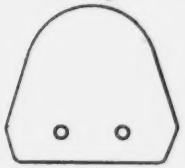
Batavia



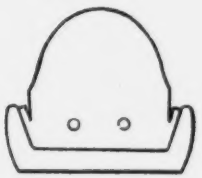
American.



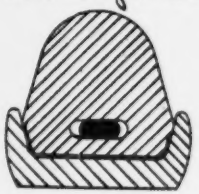
Firestone-Victor
Kelley-Maus
Imperial



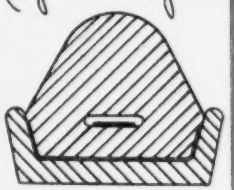
Goodyear Wing Tire in Channel.



Compts Ex
New England Tire



Compts Ex
Morgan & Wright Tire

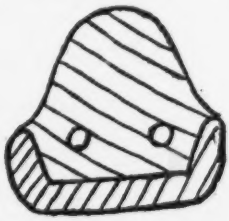


Compts.' Ex.
Piece of
Morgan & Wright
TWO-WIRED TIRE.

Compts.' Ex.
Piece of
International
TWO-WIRED TIRE.

Compts.' Ex.
Piece of
Wernicke
TIRE.

COMPLAINANTS' EXHIBIT NO. 5, AMERICAN LIP TIRE.



In the U S Circuit Court - Southern Dist of New York

The Rubber Tire Wheel Co
vs.
The Columbia Pneumatic Wagon Wheel Co } In Equity

be treated and used as a part of the complainants' record herein, and that the defendant's part of the said record shall be treated and used as a part of the defendant's record herein, and with like force and effect as though the various depositions contained in said record had been duly and regulary taken herein, and the other proceedings contained in the said record duly had herein; that both parties hereto, shall have the equal right to introduce into this case, and when so introduced shall form a part of their respective records herein, any of the depositions or other proceedings forming a part of the transcript on appeal in the case of these complainants against the Kokomo Rubber Company in the Court of Appeals for the Seventh Circuit, each party to regularly offer in evidence herein, as a part of their respective proofs for final hearing, and within the time for the taking of their respective proofs, such of the depositions from said record as they desire to use under this stipulation; that in addition to the foregoing records each party shall have the full right to take or offer herein such additional testimony as they may desire or think necessary, by the examination of witnesses or otherwise, the defendant's counsel to notify the complainants' counsel on or before July 15, 1905, if he desires to take or offer any additional proofs for final hearing on the part of the defendant, and, if so, to take or offer such proofs on or before August 1, 1905, or between September 1 and September 15, 1905; and that upon the so closing of defendant's proofs, the complainants' counsel shall, within a reasonable time thereafter, notify the defendant's counsel, if they desire to take or offer any additional proofs by way of rebuttal on the part of the complainants, and if so to proceed to take the same within a reasonable time thereafter, so that this case may be placed upon the calendar for the October term of this Court, and to be heard as soon thereafter as possible.

The following exhibits were put in evidence on behalf of the complainants in the suit brought by the complainants herein against the Firestone Tire and Rubber Company, and were put into the record in this case by the complainants herein under a stipulation that they might be given the same force and effect as if they had been put in evidence in this case.

Robert H. Wiles was examined as a witness on behalf of the defendant in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

Circuit Court of the United States, Southern District of New York.

In Equity.

THE CONSOLIDATED RUBBER TIRE COMPANY and the THE RUBBER TIRE WHEEL COMPANY, Complainants,

vs.

FIRESTONE TIRE & RUBBER COMPANY, Defendant.

Testimony taken in the above-entitled cause on behalf of defendant, before Frederick C. Goodwin, Esq., a notary public, at the office of Messrs. Offield, Towle & Linthicum, Chicago, Illinois, under the Equity Rules, pursuant to agreement of counsel, beginning at 11:30 A. M. on Tuesday, October 3, 1905.

Present: Mr. Paul A. Staley, for complainants; Mr. Charles C. Linthicum, for defendant.

ROBERT H. WILES, a witness produced for and examined on behalf of the defendant, being first duly sworn, deposes and testifies as follows in answer to questions by Mr. Linthicum:

Q. 1. Please state your name, age, residence and occupation or profession.

A. My name is Robert H. Wiles. My age is 54 years. I am a mechanical expert in patent causes, living and doing business at the City of Chicago, Illinois.

Q. 2. What experience have you had tending to qualify you to testify as a mechanical expert in suits for infringement under letters patent of the United States?

A. As a preparatory education, I graduated in the course in science at Cornell University in July, 1874. In January, 1877, I was admitted to the practice of law on examination before the Supreme Court of the State of Illinois, and for some years thereafter I was engaged in the general practice of law at Freeport, Illinois. In the latter part of the year 1881 I filed in the United States Patent Office a number of applications for letters patent for inventions made by different persons at Freeport, and upon the successful prosecution of these applications other business of the same kind came to me in such amount that I presently gave up the general practice of law, and from that time I have given my entire attention to matters pertaining to inventions. I have prepared and prosecuted a large number of applications for letters patent, and have thus become familiar with the reading of drawings and the language of specifications and claims. In the prosecution and amendment of cases, I have necessarily compared the claims of pending applications with prior devices shown as matter of anticipation or limitation, and have drawn claims distinguishing between devices so shown to be old and those supposed to be new. I have made frequent searches in the records of the United States Patent Office to determine the probable patentability of devices supposed to be new, or to fix the scope

and validity of the claims of patents already issued. In recent years I have testified very frequently as an expert in patent causes, and for a number of years I have given practically my entire attention to testifying, or preparing to testify, in patent causes. In so testifying I have necessarily compared the claims of patents sued on with earlier devices produced as matter of anticipation or limitation, and with later devices alleged to contain the inventions set forth in the claims. The entire experience thus briefly stated has familiarized me with the examination and comparison of mechanical devices, as well as the examination and explanation of patents and the claims thereof; and in my judgment, this experience has qualified me to testify as an expert in any suit involving patents for mechanical devices.

Q. 3. Have you examined and do you understand letters patent of the United States No. 554,675, of February 18, 1896, to Arthur W. Grant, for rubber tired wheels, a copy of which has been offered in evidence in this case as "Complainants' Exhibit No. 1, Patent in Suit"?

A. I have examined said letters patent, and I believe I fully understand the construction set forth therein.

Q. 4. Have you considered the deposition of Mr. Livermore, the complainants' expert, given in this case in reference to said patent and "Complainants' Exhibit No. 3, Defendant's Rubber Tired Wheel"?

A. I have examined the exhibit in question and have carefully read the deposition of Mr. Livermore referring to said exhibit and to the patent in suit.

Q. 5. Have you also examined, and, if so, to what extent, the records in the suits brought under this patent, and entitled as follows:

The Rubber Tire Wheel Company v. Columbia Pneumatic Wagon Wheel Company, in the Southern District of New York, decided by Judge Thomas.

The Rubber Tire Wheel Company v. The Goodyear Tire & Rubber Company, in the Circuit Court of the United States for the Northern District of Ohio, in which the opinion was rendered by Judge Wing at Circuit, and which was appealed, and the decision on the appeal rendered by Judge Lurton.

The Consolidated Rubber Tire Company et al. v. The Finley Rubber Tire Company, in the Circuit Court of the United States for the Northern District of Georgia, decided by Judge Newmann.

The Consolidated Rubber Tire Company, The Rubber Tire Wheel Company and others v. The Kokomo Rubber Company, in the Circuit Court of the United States for the District of Indiana.

A. I have read portions of the records of the above entitled suits, as follows:

In the record of the suit of *The Rubber Tire Wheel Company v. Columbia Pneumatic Wagon Wheel Company* I have read the opinion of Judge Thomas.

In the record of the suit of *The Rubber Tire Wheel Company v. The Goodyear Tire & Rubber Company* I have read the deposition

of Joseph P. Livermore, on behalf of the complainant; the deposition of James W. See, on behalf of defendant; the opinion of Judge Wing in the Circuit Court, and the opinion of Judge Lurton in the Circuit Court of Appeals.

In the record of the suit of *The Consolidated Rubber Tire Company et al. v. The Finley Rubber Tire Company* I have read the opinion of Judge Newmann.

In the record of the suit of *The Consolidated Rubber Tire Company, The Rubber Tire Wheel Company et al. v. The Kokomo Rubber Company* I have read the deposition of Joseph P. Livermore, on behalf of complainants, and the deposition of Irvine Miller, on behalf of defendant.

Q. 6. Please state what, in your opinion, is the status of this Grant patent, in view of the prior art. In giving this answer, you may refer to such illustrations of the prior art as are mentioned in the records and opinions above identified, and such further illustrations as have come under your observation.

A. In answering this question, I shall first briefly consider the patent in suit for the purpose of making its intended disclosure as clear as possible, and shall then compare it with various patents of the prior art which have been submitted to me, in order to determine the novelty, if any, involved in such disclosure. Having done this in my own way, I may then refer to any portions of the records pointed out in the last question and answer, in order to show what views the different courts have expressed in relation to the patent in suit when considered in comparison with the prior art.

The patent in suit—that is, the Grant patent No. 554,675, of February 18, 1896—relates to improvements in rubber-tired wheels, according to the statement of the specification; and it shows and describes a wheel of ordinary structure provided with a channel-like metal rim, a rubber tire seated in said rim, and two endless retaining-wires extending circumferentially within the body of said tire and having the function of holding it in place in the rim—the rim itself being fastened circumferentially upon the ordinary wooden felly of the wheel. Looking at the drawings of the patent (and more particularly at Figure 2 thereof), it will be seen that the felly is designated by the reference letter *a;* that the channel-like rim is designated by the reference letter *b;* that the tire is marked *c;* and that the two retaining-wires are each designated by the reference letter *d*. Without interrupting this description at this point to refer to patents of the prior art, I may say that the combination of a suitably-supported channel-like rim, a rubber tire seated in the rim, and the two endless retaining-wires passing circumferentially through the tire and holding it to its place in the rim, was in no sense new at the time of the application for the Grant patent—it having been common, in fact, to hold the rubber tire in place in its channel-like rim by means of a single endless retaining-wire passing circumferentially through the tire, or by means of a plurality of such wires parallel to and independent of each other, or by means of a single, endless, flat strip, likewise extending circumferentially through the tire.

The description of the tire in the specification of the Grant patent begins in line 24 of page 1, as follows:

"In constructing my improved rubber tire, I take an ordinary vehicle-wheel, preferably with a plain wooden felly *a*, and to this wooden felly *a* I secure a metallic rim *b*, having at its edges outwardly-projecting flanges *b'*. These flanges *b'* extend outwardly from the rim *b* at an angle, so as to form a groove or channel having tapered or beveled sides, with the bottom of said groove or channel smaller in cross-section than the top."

That is to say, the rim *b* shown and described in this Grant patent, is a metal channel having flaring sides. A channel-iron of this form of cross-section is perfectly familiar, and channels of this general type (sometimes precisely like the one shown in the drawing of the Grant patent, and sometimes differing in details therefrom) are shown and described in patents of the prior art, as wheel-rims receiving rubber tires of suitable cross-section.

Immediately after this description of the rim *b* in the specification of the Grant patent, there is the following description of the means of attaching the tire to the rim, the tire itself being only briefly mentioned in this particular portion of the specification:

"In this groove or channel I place a rubber tire *c*, which is of peculiar shape. This rubber tire is formed preferably of a single piece, but not continuous. It is provided throughout its length with openings *c' c'*, through which are passed retaining-wires *d*. These retaining-wires are separate and independent and extend entirely through the openings *c'*, and the ends of each of said retaining-wires are united together after the rubber has been compressed endwise on said wires, thus forming two independent and continuous retaining-wires within the rubber tire, the ends of which, by reason of the compression, are brought together so as to entirely cover the wires and the united ends thereof."

It will be seen that this paragraph calls attention to the two separate and independent retaining-wires extending circumferentially through the tire, to the fact that the two ends of each wire are permanently joined (so that each of the wires is endless when the assembling of the parts is completed), and to the fact that the ends of each of the two wires are "united together after the rubber has been compressed endwise on said wires." I have already pointed out the fact that it was not novel with Grant to fasten his rubber tire in place in the channel-like rim by means of two independent, endless retaining-wires passing circumferentially through the tire. I may add that it was not novel with him to give each of the two wires its endless form by joining its ends after longitudinally compressing the rubber tire.

Having thus described the rim and the arrangement of the circumferential retaining-wires which hold the tire in place therein, the specification of the Grant patent goes on to specifically describe the tire itself; and, as the shape of the tire is referred to in the patent as of great importance, I quote the entire description, which is as follow:

"The tire proper *c*, is formed of substantially the same depth as

width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of the rim, the exposed sides of the tire being formed preferably on the lines c^2 at an angle to each other and also to the flanges b' of the wheel-rim. The unexposed portion of the tire, or that portion which is inclosed within the rim, is formed of substantially the same shape as the inner channel of the rim—that is to say, it is tapered from the outside inwardly, so that the sides of the inner or unexposed portion of the tire are also formed on the lines c^3, forming with the lines c^2 an obtuse angle. The lines c^3, however, are less in length than the inside of the flanges b', so that the angle or corner c^4 between the sides c^2 and c^3 falls below the outer periphery of the flange b' and within the channel between said flanges. The openings c' through which the retaining wires pass are also formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b'.

"The bottom portion of the tire is reinforced with a canvas strip c^5, which covers the entire bottom and may project slightly along the sides c^3, but does not in any case extend up as far as the angle or corner c^4."

The part of the specification thus quoted (which is all the *description* of the tire proper appearing in the specification) sets forth the following facts in relation thereto:

1st. That the tire has the cross-section shown in the drawing, the distinctive feature of that cross-section being that the tread portion of the tire is narrower than the base portion and has sloping sides diverging from the tread toward the base.

2nd. That the inner or base portion of the tire fits the channel-like rim—the sides of said base-portion being inclined outwardly to fit the flanges of the rim.

3rd. That the angles or corners formed by the inwardly-diverging sides of the exposed portion of the tire and the outwardly-diverging sides of the base portion of the tire are "below" the edges of the flanges of the rim, so that the widest part of the tire is within the channel.

4th. That the openings c', through which the endless retaining-wires pass are slightly below the edges of the flanges—that is, are within that portion of the tire lying in the channel-like rim.

5th. That the bottom portion of the tire is reinforced by means of the canvas strip which is shown as covering the bottom of the tire and extending slightly above the bottom upon the sides of the base-portion.

As to the first of these considerations, it may be said that the peculiar cross-section of the Grant tire was not novel with Grant; and that its principal characteristics were adopted in the prior art for the same reasons set forth in a later portion of the Grant specification, from which I shall presently quote.

As to the second consideration, it may be said that one of the commonest features of construction illustrated in the prior art

is such adaptation of the base-portion of the rubber tire to the channel-like rim as shall make the base of the tire conform to the rim.

As to the third consideration, it may be observed that it was not new with Grant to seat the rubber tire in a channel-like rim having flaring or outwardly-diverging sides, or to have the widest portion of the tire somewhat below the edges of such flanges, or to have the inner edges of the sides of the exposed portion of the tire below the edges of such flanges.

As to the fourth consideration, I may say that it was common in the prior art to place the wire or wires circumferentially in the tire, either outside the rim flanges or between them—the choice of one construction or the other being open to any maker or deviser of rubber-tires at the time of the application for the Grant patent.

As to the fifth consideration, I may say that the use of a reinforcing strip of canvas between the rim and the seated portion of a rubber tire was a very common expedient prior to the date of the application for the Grant patent.

Adjourned to Wednesday, October 4, 1905, at 10 o'clock a. m.

WEDNESDAY, *October* 4, 1905—10 o'clock a. m.

Met pursuant to adjournment. Present as before.

Mr. WILES continuing his answer to Q. 6:

Following this detailed description of the tire in the specification of the Grant patent, there is the following statement in relation to the advantages of the specific construction in question; and I quote the entire statement in order that the position of the patentee may be clearly understood:

"The tire has been described thus minutely because the constructions described are important. By having the sides of the exposed and unexposed portion- of the tire formed inclined and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the opening *c'*. The reinforcing of the bottom of the tire by the canvas strip, which may be formed into the rubber, is desirable, as it has a tendency to prevent the breaking of the rubber below that portion of the tire which is between the retaining-wires and the rim. At the same time, by having the canvas strip wholly within the rim, all danger of stripping the edge of the canvas from the rubber, which would eventually result in a fracture of the rubber to the opening *c'*, is prevented.

"It has been found in practice that by the constructions above described I produce a rubber-tired wheel-rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market."

The first paragraph of this quotation sets forth two advantages due to the structure of the tire—one of these advantages being stated as the result of the form of the tire, and the other being based upon

the employment of the canvas strip with which the bottom of the tire is faced. The advantage claimed for the tire because of its shape is, in effect, the decrease (or avoidance) of tendency of the rubber tire to cut on the edges of the flanges of the rim—this decrease of such tendency to cut being due to the fact that while the sides of the base portion of the tire are inclined outwardly, the sides of the outer or exposed portion thereof are inclined inwardly, so that such exposed or tread portion is narrower than the inner base portion, which is seated in the channel. As I have said before, this general shape of the tire was not novel with Grant; but, on the contrary, it was recognized in the prior art as a desirable shape by reason of its tendency to prevent cutting of the tire on the edges of the rim-flanges. The advantage claimed as resulting from the employment of the canvas strip is merely the strengthening of the base of the tire. The use of canvas was common and well known in tire-construction prior to the application for the Grant patent, and it was perfectly well understood that the facing of the seating base of the tire was a desirable strengthening and protecting expedient. In my judgment, the presence or absence of the canvas strip is wholly immaterial, so far as the matter of the novelty of the Grant tire is concerned.

The short concluding paragraph of the above quotation is merely a general laudatory statement, and may be considered as commercial rather than mechanical.

I do not desire to discuss the claims of the Grant patent at this point, but I quote them here for the reason that I may desire to refer to them in connection with my discussion of some patent or patents of the prior art. The two claims are as follows:

"1. A vehicle-wheel having a metallic rim with angularly-projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining-wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

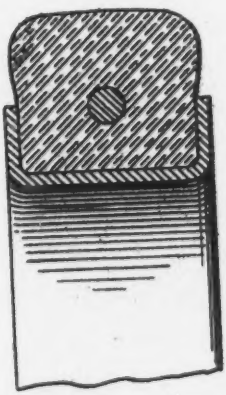
"2. A vehicle-wheel having a metallic rim with outwardly-projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining-wires in said openings, and a reinforcing-strip of fibrous material placed at the bottom of said tire wholly within said flanges, substantially as specified."

It will be seen that the second claim is substantially the same as the first, with the exception that the second claim contains one element—the reinforcing strip of fibrous material—which does not ap-

Greene.

No. 169,100. Oct. 26, 1875.

Fig. 2.



pear in the first claim. It may be observed that neither of the claims is limited to the specific construction dependent upon the endwise compression of the rubber tire prior to the connection of the ends of the retaining-wires—that feature of construction not being mentioned in either claim.

In the foregoing consideration of the specification of the Grant patent I have quoted in full all the descriptive and explanatory matter contained therein, including all matter relating to the supposed advantages of the tire-construction disclosed by the patent. All the matter in the specification divides itself naturally and obviously into different sections; and I have quoted these sections separately in order to clearly distinguish each branch or section from the others. In addition to this I have made some general observations in relation to certain disclosures of the prior art, these observations being directed to the various matters to which the sections of the specification relate. I will now refer to such patents of the prior art as seem to me pertinent, pointing out in each patent only those structures which seem to me to have some material bearing on the question whether the Grant tire exhibits any novelty or invention in view of the state of public knowledge at the time of the application for the patent in suit.

I have had prepared a series of drawings, each representing one or more figures of the drawing of some one of the prior patents to which I shall refer. Nearly all these drawings are direct tracings from the corresponding figures of the patents, respectively; but some of them are enlargements of the figures of the patents, it being my purpose to have the tire-sections, roughly speaking, of approximately the same size. In discussing the prior patents I shall refer to the specifications and drawings of the patents themselves; but it is my intention to insert reproductions of the series of drawings in question wherever I find it desirable as matter of illustration of the text of my deposition.

The Greene Patent No. 169,100, *October* 26, 1875.

This Greene patent relates to improvements in rubber tires for vehicle-wheels, and shows and describes a portion of a wheel, a channeled rim attached to the felly thereof, a rubber tire seated in said rim, and an endless retaining-wire extending circumferentially through the tire and holding it in place in the rim. Figure 2 of the drawings of this patent shows clearly the cross-sections of the rim and tire, and an enlargement of said Figure 2 is one of the drawings of the series to which I referred above. As the parts are shown in the drawing, the flanges of the rim are at right angles to its bottom or base; the base portion of the tire fits the rim-channel, and the retaining-wire is midway between the flanges and its central line is at the same distance as the edges of the flanges from the base or bottom of the rim. The drawing of the patent shows a single round retaining-wire; but the specification of the patent, after pointing out the nature of the invention, says:

"This I have carried into practice in various ways. Thus I have

combined with, or placed into the body of, the rubber tire, an endless band of wire, variously shaped, flat, round, or twisted. I have also combined with it chains or multiple-stranded cables of wires, or other means substantially the same, or the equivalent of these.

"The rubber tire thus constructed is made in a mold, and vulcanized with the metallic anti-stretcher embodied in the plastic rubber compound."

It will be seen that this early patent of 1875 discloses the combination of a channeled rim, a rubber tire therein, and an endless retaining-wire within the rubber tire; and that the fundamental combination of the Grant structure was thus fully disclosed twenty years before the filing of the application for the Grant patent. This primary combination having been thus made matter of public knowledge, the only progress from the date of the Greene patent up to the time of the Grant application was merely as to matters of details of form and arrangement; and, in my judgment, these variations of detail had been so fully developed when Grant entered the field with the application for the patent in suit that the structure shown and described in that application involved no invention whatever.

It will be noted that the specification of the Greene patent described the retaining-wire as placed within the rubber of the tire when the latter is placed in the mold for vulcanization. That is to say, the annular tire, with the annular retaining-wire within it, is completely formed prior to the application of the tire to the rim. The specification of the Grant patent does not state whether the ends of the retaining-wires of the Grant tire are to be fastened together before the tire is applied to the rim, or are to be fastened together as one step of such application of the tire—the ends of the tire-strip being brought together upon the rim, and being fastened together by uniting the ends of the retaining-wires. According to the testimony of Mr. Grant, however, in the suit of *The Rubber Tire Wheel Company* v. *The Goodyear Tire & Rubber Company,* both these methods of construction are followed in the manufacture and application of the Grant tires. It appears, therefore, that the forming of the tire and its retaining-wire into a complete annulus before applying it to the rim does not differentiate the Greene structure from the tire of the Grant patent, since that method is within the contemplation and intent of Grant's disclosure.

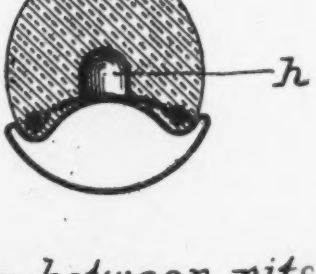
The Welch British Patent No. 14,563 *of* 1890.

The Greene patent last above referred to shows a rim, a rubber tire, and an endless single wire extending circumferentially through the tire and holding it to its place in the rim. This Welch British patent of 1890 is one of a number of patents of the prior art illustrating the use of two such endless wires extending circumferentially through the tire and adapted to hold it in place on the rim. The drawing of this British patent shows, in different figures, a variety of cross-sectional forms of tires mounted on corresponding rims and provided each with a pair of retaining-wires. In speaking of the

Welch. (British)

No. 14563. of 90.

Fig. 7.



Section between pits. h.

form shown in Figure 1 of the drawing the specification refers as follows to these wires:

"In order to secure the rubber or elastic tires to the rims I insert two wires or cores *d e* (which may be of steel, brass, bronze or other sufficiently inelastic material to answer the purpose) one on each side of the rim, the ends of the wires may be connected with a nipple *f*, having a right and left hand thread screwed thereon, or I may put a thread on one end of the wires, a head on the other and connect it with a similar device as shown with reference to Fig. 21, or in any other suitable way."

Figures 7 and 8 of the drawing are a transverse section and longitudinal section, respectively, of one cross-sectional form of rim, tire and retaining-wires to which I wish to call especial attention. It will be seen that the rim has low marginal flanges which are inclined upward and outward; that the base of the tire conforms to the rim, and that the two retaining-wires are placed symmetrically on opposite sides of the center of the tire and near its lower face. The cross-section (Figure 7) shows a hollow or space at the center of the base of the tire; but Figure 8 (which is a longitudinal section) shows that the tire is, in the main, solid, and that the space shown in Figure 7 is merely one of a series of small pits or depressions *h* in the base of the tire.

In view of this Welch British patent it would seem that at the time of the application for the Grant patent in suit there could have been no invention in providing a tire of any suitable cross-section with two endless retaining-wires intended and adapted to hold it in place in its seat on the rim of a wheel. Thus, for instance, it appears to me that in view of this Welch patent there could have been no possible invention in providing the Greene tire of patent No. 169,100 with two independent, endless retaining-wires instead of the single, endless retaining-wire shown and described in said Greene patent as the means for holding the tire in its place. The use of two endless retaining-wires instead of one is one of the developments of the prior art subsequent to the Greene patent; and I should say there could be no possible invention involved in applying this publicly-known development of the art to the Greene tire, or to any other tire of any given cross-section, whether such tire had or had not been previously provided with two retaining-wires, or with any retaining-wire or retaining-strip of any kind whatever.

It is to be noticed that Welch proposes, in the British patent, to connect the ends of the retaining-wires, by means of screw-threaded devices, "or in any other suitable way." The Grant patent does not point out any specific means or method for uniting the ends of the retaining-wires, and it may be assumed that the patent contemplates the employment of any known means for that purpose. Prior to the Grant patent application, it was known that the ends of wires might be securely connected, either by brazing or by electric welding. These were publicly-known expedients for that purpose, at the time of the filing of the application, and in considering the effect of this Welch British patent, for instance, as part of the prior art with relation to the Grant patent, the Welch patent is to be estimated,

not only by considering its bare disclosure, but by considering that disclosure as supplemented by such well-known advances in mechanical methods as would be within the mechanical skill of an intelligent workman, at the time of the filing of the Grant application. Thus, for instance, if the means and method for fastening the ends of the retaining-wires together (so as to make them endless) was a material feature in this comparison, the Welch patent ought fairly to be estimated by considering its disclosure as supplemented by the fact that when Grant filed his application for the patent in suit it was well known that the ends of such retaining-wires might be fastened together by brazing or electric welding (instead of fastening them together by means of screw-threaded unions as proposed in the Welch patent itself).

One of the series of drawings which I have had prepared comprises two figures, one of which is a tracing of Figure 7 of the Welch British patent under consideration, while the other is a cross-section between the pits *h h*—the section at any point between such pits being solid, as shown in said second figure.

The Timberlake British Patent No. 20,706 *of* 1890.

This Timberlake British patent shows and describes a rim, a rubber tire and two retaining-wires combined to form a single structure; and the drawing shows a number of somewhat different forms of the tire and rim so combined and held together by the retaining-wires. As the parts are shown in Figures 6 and 7, the bottom of the tire rests on a base or main supporting surface in the rim, which is flat in cross-section; and at the side margins of this flat base there are upwardly and outwardly flaring flanges between which the tire is placed. Neither of these figures shows the retaining-wire. In the construction shown in Figure 3, the central portion of the rim is flat and supports the correspondingly flat portion of the base of the tire; but at its outer edges the tire is provided with downwardly projecting ribs which conform to corresponding channels in the rim, the rim being turned upward and outward at the outer edges of these channels. The retaining-wires F F extend circumferentially through the tire and are so placed as to correspond to the location of the channels in the rim. I refer to this patent, chiefly, as affording another illustration of the use of two independent retaining-wires for holding the tire in place on the rim; but I may call attention to the following statements quoted from the specification of the patent:

"Hitherto cushion tires have often been cut and mutilated by the sharp edges of the rim, and the life of the tire is thereby greatly reduced; by the peculiar formation of my rim, however, this defect is entirely avoided." (l. 37, p. 1.)

"In all the above figures (except figures 6 and 7) the tire is compressed on the rim, all parts of the tire being thus in compression instead of in tension. This plan possesses advantages over the old way of stretching the tire on, as none of the cushion properties are

Timberlake. (British)
No. 20.706 of 90.
Fig. 3.

destroyed; the tire is not liable to come off, and it is not so easily cut, or if cut would close up again."

Looking particularly at Figure 3, for instance, it will be seen that the base of the tire conforms to the rim; that the ribs at the outer edges of the base lie within the channels in the rim; that the outer faces of these ribs are inclined upward and outward to conform to the flanges of the rim; that the outer or side faces of the tread portion of the tire are inclined downward and outward, the tread being the narrowest part of the tire; and that there is an angular space between the upper, outer portion of each rim-flange and the corresponding portion of the tire, so that (to use the language of the Grant patent) "no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle." That is to say, this Timberlake patent recognizes the danger of cutting of the tire on the edges of the rim-flanges, and provides a structural form intended and adapted to obviate the difficulty. It is to be noticed, further, that in the construction shown in Figure 3 the bottom of the tire is provided with a facing B C of canvas which covers the entire bottom surface of the tire, including the downwardly-projecting ribs thereof, which correspond in location to the retaining-wires.

One of the drawings which I have prepared, as above set forth, is a tracing of Figure 3 of the drawing of this Timberlake patent.

The Rodgers Patent No. 539,826, *of May* 28, 1895.

This Rodgers patent relates to improvements in rubber tires, and shows and describes one form of channeled wheel-rim and a number of forms of rubber tires, all adapted to be used with said rim. Looking at Figure 1 of the drawing, it will be seen that the rim A is a metal trough or channel externally rectangular in cross-section, but having its side flanges thinner at their upper edges than at their lower edges, so that the channel proper is wider at the top than at the bottom. Figures 1 to 5 show somewhat different forms of two-part tires, one part of each of said tires being a rubber channel of such external cross-section as to fit the rim, but of half-oval internal cross-section. The other part of the tire is of rubber and is oval in cross-section, so that its lower portion fits in the rubber channel. The rubber base-portion B of each of these two-part tires is held in place in the rim by means of two wires extending circumferentially through it and placed near its lower outer angles. The other member C of the two-part tire is held in place in the base-portion of the tire by means of one wire (as shown in Figures 1 and 3), or by means of two independent parallel, circumferential wires, as shown in Figure 4. As the parts are shown in Figures 1, 3, 4 and 5, the retaining-wires are partly above and partly below the edges of the rim-flanges—the central line of each wire being approximately even with the edges of the flanges.

Figures 6, 7 and 8 of the drawings of this patent illustrate a one-piece tire having the same cross-section as the entire two-piece tire shown in Figures 1, 4 and 5. That is to say, Figures 6, 7 and 8

illustrate the construction in which the base-portion B and the oval portion C of the two-part tire are made integral—the base-portion of this integral tire being marked B′, and the upper or tread portion being marked C′. Figure 6 shows this tire perforated for the passage of a single retaining-wire; Figure 7 shows it perforated for the passage of two independent retaining-wires, and Figure 8 shows it formed with a longitudinal (circumferential) opening adapted to receive a flat retaining-band. All these circumferential perforations or openings are so placed that when the tire is seated in the channeled rim the retaining-wire or wires, or the retaining-strip, will be wholly below the edges of the rim-flanges.

This Rodgers patent is interesting, primarily, because it illustrates and describes the use of a single endless retaining-wire, the alternative use of two independent endless retaining-wires and the alternative use of an endless retaining-band—all these constructions being thus obviously made interchangeable equivalents of each other, so far as the consideration of any matter of invention is concerned. Wholly aside from any other patents of the prior art, it is obvious that in view of this Rodgers patent there could have been no invention (at the time of the filing of the Grant application) in choosing between a single endless retaining-wire, two independent endless retaining-wires, and a single, endless, flat band, as the means for holding a tire of any given cross-section in its place on or in the rim of a wheel. This conclusion is equally obvious from other patents of the prior art; but the Rodgers patent is a particularly convenient illustration for the reason that it shows, side by side, the single wire, the two independent wires, and the single, flat band, all employed for the same purpose,—namely, the purpose of holding the tire in its channeled seat in the rim.

The Rodgers patent is interesting from another point of view, in that it shows, describes and specifically points out a construction intended and obviously adapted to prevent cutting of the tire against the edges of the rim-flanges. The statement of the specification, beginning in line 11 of page 1, relates to the general nature of the Rodgers invention; and the following portion of that statement refers particularly to the purpose of thus safe-guarding the tire:

"My invention relates to that class of tires made of rubber and held within a flanged or concave rim, and consists * * * in terminating the inner part of the rubber tire, fitting within the rim, in shoulders, or at the outer edges of the rim flanges *and making the outer, wearing part of the tire of less diameter than the inner part, and than the distance between said flange edges so that it cannot be pressed outward over said flanges to be cut thereby.*"

The specification of the patent, in describing the form shown in Figures 1, 3, 4 and 5, states that the retaining-wire *e*, or other suitable form of metal core, is drawn through the perforation in the tire and has its ends joined "in any suitable manner,"—the rubber "being compressed thereon to give it the desired power of resistance." The construction shown in Figures 6, 7 and 8 is fully described in the paragraph beginning in line 12 of page 2, which is as follows:

Rodgers

No. 539,826. May 28, 1895.

Fig. 6.

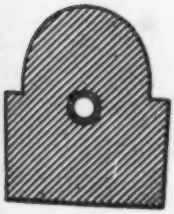


Fig. 7.

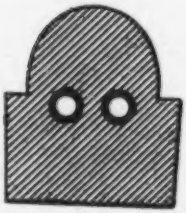
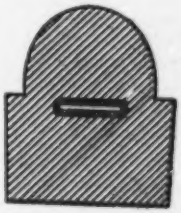


Fig. 8.



"In Figs. 6, 7 and 8, the tire is shown made in one piece, the inner part, indicated by B', terminated in the shoulders b^3, at the outer edges of the rim flanges, and the semi-cylindrical or semi-elliptical part C', (corresponding to the part C) rising centrally from the periphery of the part B', *with its sides sufficiently removed from the rim flanges to prevent the part C' from being crowded over upon and cut by said flanges.* In this construction, the tire may be perforated for one wire, as in Fig. 6, for two, as in Fig. 7, or for a flat metal core, as in Fig. 8. Where the latter is used, its ends, indicated in Fig. 9 at d', d', may have inclined slits or notches d^2, cut in their opposing edges, extending half the width of the flat strip or core, for coupling the ends firmly and bringing them into the same vertical plane. *In either case the rubber should be considerably compressed, longitudinally, on the core,* it having been found, by practical test, that rubber, under compression, will much more successfully resist injury from rough and cutting surfaces of the road over which it passes in use."

It will be seen from the foregoing consideration of this Rodgers patent, first, that it shows and describes a channeled rim having a flat base and outwardly-flaring flanges; that the base-portion of the rubber tire conforms to this rim; that the widest portion of the tire is within the channeled rim; that the exposed or tread portion of the tire is narrower than the base-portion and is so far within the rim-flanges as to be guarded against any possibility of being forced over the flange, so that it might be cut or injured by the edge of the flange; that the tire is held in place in the rim either by a single, endless retaining-wire, two independent endless retaining wires, or an endless, flat retaining-band; and that, whatever may be the form of retaining-device, the ends are fastened together (for the purpose of making the retaining-device "endless") after the rubber has been "considerably compressed longitudinally." It appears, then, that Rodgers had in view the specific objects and purposes contemplated in the Grant patent sued on herein; and that in order to realize these objects and purposes, he devised a tire specifically intended and adapted for that end. In view of the Rodgers patent alone, it is doubtful, in my mind, whether the tire of the Grant patent shows any invention whatever; but other patents of the prior art to which I am about to refer seem to me to demonstrate that in constructing the tire of the patent in suit Grant did nothing more than to avail himself of the discoveries of prior constructers by selecting from different sources certain peculiarities of form and arrangement which appeared to him to be the most desirable.

One of the drawings of the series which I have had prepared is an enlargement of Figures 6, 7 and 8 of the drawings of this Rodgers patent No. 539,826.

The Elliott Patents Nos. 440,701 *and* 440,702, *November* 18, 1890.

These two Elliott patents, which are closely related, relate to improvements in wheel tires and rims, and each of them shows a structure which combines a felly, a channeled, metal rim, a rubber

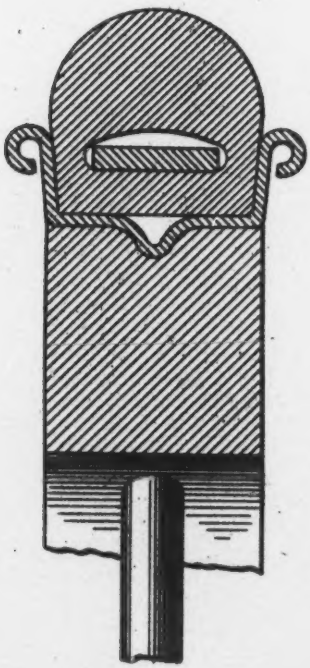
tire seated in the rim, and means for holding the tire in place. In the construction shown in either of the two patents, the metallic rim has a flat bottom and two side flanges flaring slightly outward, and having their edges rolled outward to form beads, as clearly shown in Figure 2 of the drawing of each of the patents. In the construction shown in either of the patents, the tire has its tread portion approximately semi-circular in cross-section, while its base-portion is fitted in the channeled rim. In patent No. 440,701 (which speaks of the rim as the "metallic tire" and calls the tire proper the "rubber tire"), the purpose of forming the rim or "metallic tire" in the way thus described, is stated as follows:

"By making the metallic tire in this manner the rubber tire, when compressed by a direct or lateral pressure, and thereby overlying the metallic edges *b'*, will not be cut or injured by said edges, while said edges are made sufficiently high to properly reinforce the rubber tire."

The construction of the rim and tire shown in patent No. 440,702 is the same as the one thus referred to in patent No. 440,701; and these two Elliott patents furnish, therefore, another example of a provision for preventing the cutting of the tire on the edges of the rim-flanges—that provision being such adaptation of the shape of the tire to the shape of the rim as to prevent the possibility of pressing or expanding the tire across a sharp cutting edge at the margin of either flange. Either of these Elliott patents shows, also, the combination of the tire with a flanged rim having an outwardly-flaring shape—that is, wider at its outer or open edge than at its bottom; and in this combination, also, the base-portion of the tire is so shaped as to conform to the shape of the rim.

The Elliott patent No. 440,702 shows and describes a retaining-strip extending circumferentially within the rubber tire, in the position clearly indicated in Figure 2 of the drawing of the patent. This retaining-strip is not "endless," in the sense of having its ends joined to each other; but its ends are turned inward (that is, toward the center of the wheel) at their meeting point and are fastened to the felly. The retaining-strip thus becomes a complete ring fastened at one point to the felly instead of being an endless ring having no direct connection with any element except the tire. In my judgment, this is not a desirable construction, as compared with that in which the ends of the retaining-wire are directly joined to each other so as to form an "endless" annulus; but in view of the prior patents to which I have already referred, it seems impossible that any invention whatever could be involved in directly joining the ends of the flat band of the Elliott tire of patent No. 440,702, or in substituting for that band a single, endless retaining-wire, or a pair of endless retaining-wires. In other words, if for any reason the cross-section of the rim and tire of either of these two Elliott patents is practically more desirable than the cross-section of the rim and tire of the Welch British patent of 1890, or the rim and tire of the Timberlake British patent of 1890, or the rim and tire of the Rodgers patent No. 539,826, there is no reason why any constructor should not use the Elliott rim and tire in conjunction with a pair of inde

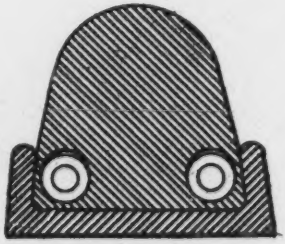
Elliott.
No. 440,702. Nov. 18, 1890.
Fig. 2.



Willoughby (British.)

No. 5924 of 92.

Fig. 8a.



pendent, endless retaining-wires extending circumferentially through the tire; and such application of the old, independent, endless retaining-wires to the Elliott rim and tire could not possibly have involved any invention whatever, at the date of the application for the Grant patent in suit.

One of the series of drawings which I have had prepared, as hereinbefore stated, is an enlargement of Figure 2 of the drawing of the Elliott patent No. 440,702—the figure which shows the location of the retaining-strip and its relation to the rim and tire. I may add, as to this relation, that this retaining-strip is below the edges of the rim-flanges and wholly within the rim-channel.

The Willoughby British Patent No. 5924 of 1892.

This Willoughby British patent relates to improvements in rubber tires for wheels, and shows and describes a number of different forms of rims, rubber tires and retaining-wires, used in combination. These various forms are shown in cross-section in different figures of the drawings of the patent, and the form shown in Figure 8a may be taken as sufficiently indicating the general type of construction. As the parts are shown in this figure, the rim has a flat base and two side flanges inclined slightly inward from bottom to top, so that the space within the channel is narrowest at the top, or open edge. The rubber tire is of such cross-section that its side faces incline inward from the base to the tread—the extreme tread portion of the tire being its narrowest part. The inclination of the sides of the exposed portion of the tire is greater than that of the sides of the unexposed or base-portion of the tire (which is within the rim), so that each side face of the tire presents an obtuse angle just below the extreme upper edge of the corresponding flange. The edges of the flanges are rounded; and this form of the flanges, taken in connection with the fact that the tire decreases in width toward its tread, is evidently adapted to protect the tire against cutting upon the edges of the flanges under radial or lateral pressure.

The tire is held in place in the rim by means of two endless wires extending circumferentially through the tire and located wholly below the edges of the rim-flanges—that is, wholly within the rim-channel. These wires are not plain throughout their entire extent; but, according to the specification of the patent, they may be closely coiled throughout their entire extent to form very stiff longitudinally-extensible springs, or they may be plain throughout the greater portion of their extent, though formed with short coiled spring-portions (as shown in Figure 3 of the drawing of the patent). The specification of the patent, in describing the construction in question, describes it as comprising "coils which will not flatten, which will be flexible enough to bend around a wheel's rim, but, most important of all, which will not easily elongate or stretch so that once in their places on the rim of the wheel a deliberate effort will have to be made, in some cases with special levering tools, to enable them to be sprung off again." The specification, in the sen-

tence beginning in line 32 of page 3, briefly describes as follows the method of applying the invention to ordinary vehicle wheels:

"To apply my invention to ordinary vehicle wheels I select those already tired with a 'carmont' or somewhat similar shaped channel rim as in Figs. 5, 8 and 8ª, or in the case of new wheels I provide them with a channel tire and into this channel I spring my hooped rubber and coil combination, or lay the rubber and coil combination round the wheel in the channel before the ends are united, and by forcibly drawing the ends of the coil or coils together and uniting them I form the tire upon the wheel without having to stretch it over the flanges of the channel rim. Once on and the circle complete, lateral displacement is prevented by the sides or flanges of the channel, and the tension of the coil keeps the tire tightly in place."

It will be seen that the patentee of this British patent contemplates the employment of such spring-coils in his retaining-wires as shall be capable of maintaining a tension sufficient to hold the tire in place. This is undoubtedly possible, and when the entire retaining-wire is under such tension it must have the same operation as if it were plain (that is, not coiled) throughout its entire extent. I see no reason why the disclosure of this British patent No. 5924 of 1892, has not the same force and effect as if the retaining-wires were in fact shown and described as plain, endless wire-hoops set in rubber tires of the given cross-sections—the ends of the wires being joined before the application of the tires to their rims, or as a feature of the application of the tires to their rims. It is surely apparent that in v-ew of the various other patents of the prior art to which I have referred, there could have been no possible invention, at the time of the application for the Grant patent in suit, in substituting plain, endless retaining-wires for the coil-comprising, retaining-wires shown and described in the British patent No. 5924 of 1892 now under consideration. The patent affords, therefore, another illustration of independent, endless retaining-wires extending circumferentially through a rubber tire seated in a channeled rim—the rim and tire being conformed to each other, the widest portion of the tire being within the rim-channel, the edges of the rim-flanges being rounded, the tire being narrowest at its tread portion, and the rim and tire being, on the whole, so designed as to prevent cutting of the tire against the edges of the rim-flanges when under the influence of radial or lateral pressure.

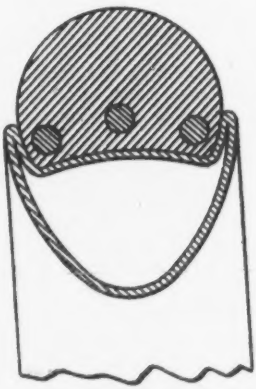
One of the drawings which I have had prepared, as stated at an earlier part of this answer, is a tracing of Figure 8ª of the drawings of this British patent to Willoughby, No. 5924 of 1892.

Adjourned to Thursday, October 5, 1905, at 10 o'clock a. m.

Latta

No. 341,811. May 11, 1886.

Fig. 5.



THURSDAY, *October* 5, 1905—10 o'clock a. m.

Met pursuant to adjournment. Present as before.

Mr. WILES continuing his answer to Q. 6:

The Latta Patent No. 341,811, *May* 11, 1886.

This Latta patent, which relates to improvements in velocipedes, shows and describes certain improvements in the wheel-structure, and also certain improvements in a rim and tire. Two somewhat different forms of rim and tire are shown in Figures 5 and 6, respectively—the rim as shown in one of the figures being hollow, while the rim shown in the other figure is solid. The construction shown in Figure 5 is one to which I wish particularly to call attention.

Looking particularly at Figure 5, it will be seen that it shows a channeled rim having flaring flanges. The rim is formed from sheet metal, and each of the flanges comprises a double thickness of the sheet metal—the metal being bent or crimped (and somewhat rounded, of course, externally) at the edges of the flanges. The bottom of the channel is very nearly flat in cross-section, though it is slightly crowning—that is, slightly higher in the center than at the sides. The rubber tire, which is seated in the rim, has its base-portion of such shape as to conform to the bottom and flanges of the rim; and the side walls of this base-portion (within the channel) are inclined outward from their lower edges, so as to fit the inner faces of the flanges. The contour of the cross-section of the exposed portion of the tire (that is, the portion of the tire above the rim-flanges) is almost exactly a semi-circle, having a diameter equal to the distance between the highest tangent-points of the tire and flanges.

The rubber tire, having the cross-section just described, is held in place in the flaring channel of the rim by means of three endless wires extending circumferentially through the tire—one of the wires being in the medial plane of the tire, while the others are equally spaced on opposite sides of the central one. The two outer wires are wholly below the edges of the rim-flanges, and the central wire is somewhat higher than the other two—it being apparently the purpose to place the three wires in substantially the same relation to the somewhat crowning base of the channel. Looking particularly at the positions of these retaining-wires, the shape of the base-portion of the tire and the shape or inclination of the inner faces of the rim-flanges, it will be seen that if any lateral pressure on either side of the exposed portion of the tire should ever be sufficient to raise the corresponding retaining-wire from its normal position, the corresponding angle of the base of the tire could lift from its seat as the wire raised, and could drop back to its seat when the lateral pressure was removed. If all three of the wires were in place, and the central wire was not moved, this central wire might be said to be the center of movement of the side wire and the corresponding angle of the tire, if any such action took place. If the central wire was absent the stationary side-wire might be said to fix the center

of any such movement if it took place. In either case, the flange would offer no resistance to the rising or falling of that angle of the tire adjacent to it.

It will be seen that this Latta tire, as illustrated in Figure 5 of the drawing under consideration, conforms exactly to the statement of claim 1 or claim 2 of the Grant patent in suit, so far as the description of the rim-flanges and channel, the adaptation of the tire to the channel, and the location of the independent retaining-wires passing entirely through the inner portions of the tire, is concerned. It will be remembered that claim 1 of the patent describes the specific shape of the Grant tire by referring to the outer portion of the tire as "having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges," and that the second claim describes the shape of the tire in equivalent terms. It can hardly be said that the outer or exposed portion of this Latta tire has "sides at an angle to the inner portion," or that there is any "angle or corner between the outer and inner portions" of the sides of the Latta tire. Except for this difference, the Latta tire would completely answer the first claim of the patent, and would equally answer the substance of the second claim—the difference between the first and second claims being merely that the second claim recites as an added element the strengthening strip of canvas—an addition which is wholly immaterial so far as any possible novelty of the claim is concerned. This difference relates solely to the cross-sections of the outer portions of the two tires (the Grant tire and the Latta tire) as distinguished from the inner or base portions of the two tires. So far as the inner or base portions themselves are concerned, they are substantially alike—each of them being shaped to conform to the flaring metallic rim in which it is seated. The difference between the outer portions of the two tires, as to cross-section, is very slight in appearance, though the shape of the outer portion of the Grant tire may be decidedly better than that of the Latta tire, as to the matter of protecting the sides of the tire against wearing or cutting on the edges of the flanges of the rim. The Grant patent points out very clearly that the peculiar shape of the tire has this advantage—the statement of the specification in this regard being that because of this peculiar shape, "the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the openings c'." This is the sole advantage attributed in the patent to the shape of the outer portion of the tire and the relation of such outer portion of the tire to the edges of the rim. If Grant had been the first to incline the sides of the exposed portion of the tire inward toward the tread to such an extent as to prevent or materially decrease the spreading of the tire over the edges of the rim-flanges, and if he had been the first to give the rim and the outer portion of the tire such relative shapes as to leave an angle between the rim and tire, above the

line of contact on either side, any advantage due to such new construction would give corresponding novelty to the whole tire and to the combination of either of the claims of the Grant patent. The fact is, however, that the effect of such shaping of the outer portion of the tire, and such relation of the tire to the rim-flanges was perfectly well understood before the application for the Grant patent; and there was no possible invention in giving this shape to the exposed part of any rubber tire seated in any kind of a rim and held in place by any means whatever. In my discussion of the prior art up to this point, I have only referred incidentally to this matter of so shaping the tire and rim (or both) as to guard against danger of the cutting of the tire against the rim-flanges; but I shall presently refer to other patents which show how fully the necessity and possibility was recognized. Assuming that there was no invention possible, at the time of the application for the Grant patent, in giving the outer portion of the tire such desirable shape, it is perfectly plain that there could have been no invention, at that date, in giving the outer portion of the Latta tire of patent No. 341,811 any such shape. In other words, any constructor of rubber tires who desired to manufacture the Latta rim and tire might have made it exactly as shown in Figure 5 of the drawings of the Latta patent, or might have varied it to the extent of giving the outer portion of the tire any previously-known cross-section; and either manufacture would have involved no invention whatever, no matter how much improved the tire might be by the variation, as to the matter of protection against cutting on the edges of the rim-flanges. Aside from this difference as to the cross-sectional shape of the outer portion of the tire, the construction shown in Figure 5 of the drawing of the Latta patent is a complete answer to claim 1 of the Grant patent and to the substance of claim 2 (which does not materially differ from claim 1); and this difference of cross-section of the outer portions of the two tires was a mere matter of mechanical choice or selection, prior to the date of the application for the Grant patent, as will be fully shown in the course of this answer.

This Latta patent, No. 341,811, was apparently not offered in evidence in the suit of *Rubber Tire Wheel Company v. Columbus Pneumatic Wagon Wheel Company*. I say "apparently," for the reason that I have not seen the record of that suit, though I have read the opinion of Judge Thomas therein. I have, however, examined some parts of the record in the suit of *The Rubber Tire Wheel Company v. The Goodyear Tire & Rubber Company et al.* Mr. Livermore, the expert called on behalf of complainants in this suit, testified on behalf of complainant in the Goodyear suit, and in that deposition he refers to a sheet of drawings (which is bound in the record) as a diagram showing all the structures of the prior [illegible] evidence in the case of *The Rubber Tire Wheel Company v. Columbia Pneumatic Wagon Wheel Company*. I have examined the sheet of drawings in question, and find that it shows a drawing taken from the Latta patent. The Latta patent was, however, offered in evidence on behalf of defendant in the [illegible] case, and Mr. Livermore discussed it briefly, as follows:

"Patent No. 341,811, to Latta was cited by Mr. See as showing a channel with concave divergent side walls and a convexly curved bottom, and also as showing a fastening composed of three round wires within the rubber of the tire and wholly within the channel of the tire seat. The construction shown in this patent as appears in the sectional view, Fig. 5, has some superficial resemblance to Grant's structure. It is really, however, totally different, the fastening wires, as appears from Fig. 1 and from the description being on the same order as those of the Willoughby British patent above discussed; that is, longitudinally elastic and capable of stretching. They are described in the Latta patent as follows:

"'*h* represents spring wires which are embedded in the rubber tire. These wires are crimped or bent into a serpentine form, as represented in Fig. 1, which permits the wires to stretch sufficiently to permit the tire to be placed into the seat of the rim, and to contract after the tire has been inserted in its seat, and thus secure the tire in its seat. These wires prevent the tire from rolling out of the seat when the wheel is in use and if one of the wires should break the others will of course retain the tire in place. The two ends of each wire are preferably secured before the rubber is moulded, so that each wire constitutes a complete ring, and the rubber tire is preferably moulded in an endless ring of the proper size to fit the wheel. The wavy or serpentine form of the wires prevents them from drawing in the tire if broken therein, so if the wires should break at several different points they would not permit the tire to become detached from the wheel.'

"As appears from the above description, this fastening is totally different in nature from Grant's non-stretchable wires, and there is no co-operation between Latta's wires, each performing its own function in co-operation with the other, as in Grant's tire, but Latta merely has a plurality so that when one breaks others will be left to do the work. The Latta longitudinally elastic wires would be totally inadequate to keep a carriage wheel tire in place, and there is no suggestion of yielding to relieve and distribute the strain as takes place in Grant's tire. This is evidenced by the following statement in the Latta patent: 'It is obvious that the tire may be secured in its seat by cement in the usual manner if desired.' Latta's fastening is undoubtedly a weaker one than Elliott's and the skilled mechanic would not naturally turn from Elliott's construction to Latta's when he found that Elliott's would not serve to hold the tire in place, but if, merely as an experiment, he should try Latta's construction its weakness would lead him to look for something stronger, and the teachings of the prior art, as derived from the Latta and Elliott constructions, would in my judgment lead to the adoption of something like what is shown in the Beale British patent rather than towards the production of Grant's structure."

In considering this Latta patent and Mr. Livermore's discussion of it, I call the attention of the court particularly to Fig. 1 of the drawings of the patent, which shows clearly the "wavy or serpentine form" of each of the wires and the degree of their variation from the form which they would have if each retaining annulus

formed from a plain or straight wire. It will be seen that the deflection of the wires to form the sinuosities is very slight indeed—so slight that it would evidently be perfectly easy to insert such wires in a tire-strip formed with the necessary longitudinal passages. It would evidently be perfectly feasible therefore to provide a tire with these slightly sinuous retaining-wires, either by molding them in the completely annular wire, or by threading them into the longitudinal openings of a suitable tire-strip, and then completing the tire by joining the ends of the wires, either before the application of the tire to the rim, or as a step in the application of the tire to the rim. In short, these sinuous wires would evidently lend themselves to the practice of the teachings of the prior art, just as if they were plain, instead of being slightly sinuous. In the assembling of the parts, these slightly sinuous wires would evidently be put under the same tension as if they were plain; and I have no doubt that they would operate precisely as if they were plain. If this is so, everything that Mr. Livermore says as to the difference between plain wires and the sinuous wires of the Latta drawing, falls to the ground.

Another consideration, having no relation whatever to the desirability of the slightly sinuous retaining-wires, as compared with plain retaining-wires, is, that Figure 5 of the drawings of the Latta patent is in itself a complete suggestion to any person familiar with drawings, of the employment of plain retaining wires. I do not mean to say that this drawing is inconsistent with the possibility that the wires may be sinuous; but I do say that, in my opinion, no intelligent person familiar with this general subject and accustomed to the reading of drawings, could look at Figure 5 of the Latta drawings without thinking of the use of plain retaining-wires as the means of holding the Latta tire in the rim-channel. In other words, Figure 5 clearly suggests, to any intelligent person familiar with drawings, the use of plain wires as the retaining means; and the natural impression thus received would only be removed by further study of the patent.

Wholly aside from the effect of Figure 5 of the drawings (when taken by itself), I say, further, that the possibility of substituting plain wires for the sinuous wires, to form the endless retaining-wires of the Latta tire would naturally (and, it seems to me, inevitably) suggest itself to any intelligent mechanic who might study the Latta patent; and it is perfectly apparent that in view of the other patents of the prior art to which I have referred, such substitution could involve no invention whatever. Let us suppose, for instance, that at any time after the issue of the Latta patent, and before the filing of the application for the Grant patent in suit, an application had been filed for letters patent upon a rim and tire illustrated by means of a drawing exactly like Figure 5 of the drawings of the Latta patent; and that the applicant had said in his specification:

"I am aware that one Latta has obtained a patent, No. 341,811, for a rim, a tire and three retaining-wires—the whole having the same cross-section as that illustrated in the drawing of this applica-

tion. The retaining-wires of said Latta tire are, however, slightly sinuous, whereas the endless retaining-wires of my illustrated tire are plain. The sinuosities of the Latta retaining-wires entail some needless expense: and they are not only not superior to ordinary plain wires, but, in fact, they are inferior thereto."

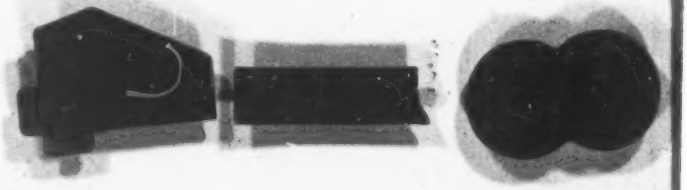
Is it conceivable that any examiner would have allowed a claim based on the substitution of plain wires for the slightly sinuous wires shown in the Latta patent, or that a patent based on that substitution could be sustained, if granted? In my judgment, the question answers itself. There could not be a shadow of invention in substituting plain wires for the slightly sinuous wires shown in the Latta patent; and such a substitution by Grant involved no possible invention.

Mr. Livermore's discussion of the course a mechanic would take if he tried the Elliott tire of patent No. 440,702 and found it unsatisfactory, seems to me to have no place in any discussion of the Latta tire. The question is, what the skilled mechanic familiar with the art as it existed at the time of the application for the Grant patent, would do if he tried the Latta tire constructed exactly as shown in the drawings of the Latta patent, and found that the slightly sinuous retaining-wires were too elastic. I see no valid reason why he should encounter that difficulty; but if he did, it appears to me perfectly obvious that his natural impulse would be to replace the sinuous wires by plain wires—the form of the rim, the conformation of the tire to the rim, and the location of the endless, independent retaining-wires remaining precisely the same as shown in Figure 5 of the Latta patent.

In my judgment, this Latta patent No. 341,811 has precisely the same effect, in considering the novelty of the tire of the Grant patent in suit, as if Figure 1 had been omitted from the drawings of the Latta patent and the wires shown in Figure 5 had been described merely as "endless, independent retaining-wires." One of the drawings of the series which I have had prepared, as stated above in the course of this answer, is an enlargement of Figure 5 of the drawings of the Latta patent.

The Grant & Jeffries Patent No. 470,483, March 8, 1892.

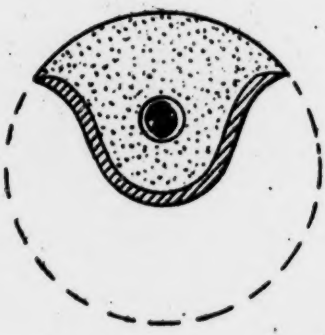
I have pointed out the fact that the claims of the Grant patent in suit do not in any way refer to or depend upon the longitudinal compression of the tire. The statement of the specification in relation to such longitudinal compression is therefore entirely immaterial, as I take it, but it may nevertheless be well to emphasize the fact that there was nothing new in this disclosure in the Grant specification. In my examination of the prior art, I have already called attention to the prior disclosure of this feature of construction and this Grant & Jeffries patent furnishes a further instance of such disclosure. The drawing of the patent shows a rim of peculiar form, a rubber tire of corresponding cross-section, and a retaining "core" apparently of two intertwisted wires. The specification states that in order to connect the ends of the core, "the tire must



Grant & Jeffries.

No. 470,483. Mar. 8, 1892.

Fig. 3.



be compressed lengthwise, so as to shorten it to, say, the point indicated by dotted lines *d* in Fig. 4. This done, the ends of the core are sufficiently exposed to effect a connection between them. Having effected such connection the tire is released, and by its expansibility its ends are brought into forcible contact." This is a complete disclosure of the longitudinal compression of the tire, and no novelty of the Grant tire of the patent in suit could be predicated on such longitudinal compression, even if it was made a feature of either of the claims.

One of the drawings which I have had prepared, as stated above, is a tracing of Figure 3 of the drawing of this Grant & Jeffries patent,—that figure being a cross-section of the rim, the tire and the retaining-core.

My discussion of the prior art has thus far been directed, in the main, to the examination of those prior patents illustrating the use of retaining-wires or retaining-bands, though I have quoted from certain of said patents references to forms adopted or means employed for the prevention of the cutting of the side faces of the tire on the edges of the rim-flanges. Thus, for instance, I quoted from the Timberlake British patent No. 20,706, of 1890, the following brief passage:

"Hitherto cushion tires have often been cut and mutilated by the sharp edges of the rim, and the life of the tire is thereby greatly reduced; by the peculiar formation of my rim however this defect is entirely avoided."

Again, I quoted from the Rodgers patent, No. 539,826 the following matter, relating to the same subject:

"In Figs. 6, 7 and 8, the tire is shown made in one piece, the inner part, indicated by B', terminated in shoulders b^3, at the outer edges of the rim flanges, and the semi-cylindrical or semi-elliptical part C', (corresponding to the part C), rising centrally from the periphery of the part B', *with its sides sufficiently removed from the rim flanges to prevent the part C' from being crowded over upon and cut by said flanges.*"

Again, I quoted from the Elliott Patent No. 440,701, as follows:

"By making the metallic tire in this manner the rubber tire, when compressed by a direct or lateral pressure, and thereby overlying the metallic edges *b'*, will not be cut or injured by said edges, while said edges are made sufficiently high to properly reinforce the rubber tire."

It will be remembered that in the Timberlake device, the rim has outwardly and upwardly inclined flanges with rounded edges; that the widest part of the tire is below these rounded edges; and that there is an angular space between each side face of the tire and the adjacent flange. It will also be remembered that in the Rodgers structure the tire has a base portion lying within and fitting the flaring channeled rim; that the exposed or tread portion of the tire is somewhat narrower than said base portion; and that the side faces of said exposed portion of the tire are considerably within the rim-flanges, so that they cannot be forced down upon the edges of the flanges. It will also be remembered that in the Elliott device, the

rim has slightly flaring flanges with round, beaded edges; that the base portion of the tire fits the channel of the rim; that there are angular spaces between each side face of the tire and the adjacent flange-edge; and that obviously the flattening of the tire, or the lateral movement of the outer portion of the tire in either direction will merely press it against the corresponding rounded surface of the edge of the flange, and will therefore have no tendency to cut the tire. I recapitulate these matters at this point, because I intend now to take up, as briefly as possible, a number of patents relating more specifically to expedients for preventing the cutting of the tire on the rim-flanges—whether the purpose of such expedients is or is not pointed out in the specifications of the respective patents.

The Everett Swiss Patent No. 8120, *February* 17, 1894.

This patent relates to improvements in velocipedes, and particularly to improvements in wheels therefor. It illustrates various forms of rims, and various forms of the connections between such rims and the spokes, and incidentally, it illustrates different forms of cushion-tires. I call attention particularly to Figures 5 and 7 of the drawing of this patent, as showing metal rims with flaring flanges, combined with cushion tires of such cross-section that each tire-base fits the bottom of the corresponding rim, but is separated from the flange on either side by an angular space. It is apparent that the tire shown in either of these figures may be flattened considerably by inward pressure or distorted laterally by side pressure, without bringing the side face of the tire into cutting contact with the edge of either rim-flange. No means for retaining the tire in the rim are shown; and it is undoubtedly the intention to cement it in place. It will be seen, however, as I examine other patents of the prior art, that the necessity for avoiding possible cutting of the sides of the tire on the edges of the rim-flanges is present, whether the tire is held in place in the rim by retaining-wires, by cementing, or by any other means.

One of the drawings of the series I have had prepared comprises enlargements of Figures 5 and 7 of the drawing of this Swiss patent.

The Kelley Patent No. 321,819, *July* 7, 1885.

This Kelley patent shows, in Figure 10 of the drawing, and describes in detail, a rim and tire alleged to have important advantages. The rim, which is of rolled metal, has a flat base and flaring side walls or flanges. The base-portion of the rubber tire fits the rim-channel. The outer or exposed portion of the tire is approximately semi-circular in cross-section. The tire is described in the specification of the patent as made up of suitably connected portions of rubber having somewhat different characteristics. An attempt is made to indicate this in Figure 10; and it is to be remembered, in looking at the figure, that the whole tire is, in fact, a body of rubber. The tire is cemented in place in the rim, and has no fastening-wires of any kind. The upper edges of the rim-flanges are

Everett (Swiss)

No. 8120. of 1894

Fig. 5.

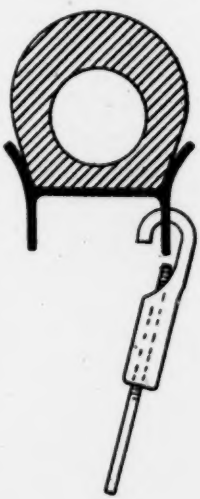
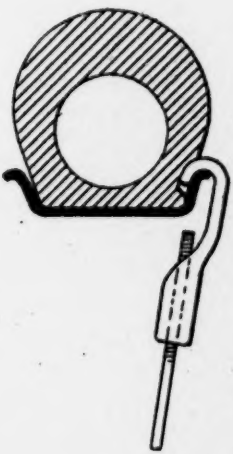


Fig. 7.



Kelley.

No. 321,819. July 7, 1885.

Fig. 10.

Kelley.

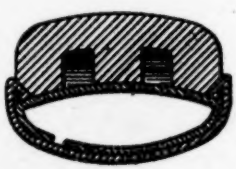
No. 362,514. May 10, 1887.

Fig. 5.

Woodward.

No. 443,735. Dec. 30, 1890.

Fig. 3.



rounded; and this shape of the flanges is adapted to decrease the possibility of the cutting of the sides of the tire on the edges of the flanges. One of the drawings of the series which I have had prepared is an enlargement of Figure 10 of this Kelley patent No. 321,819.

The Kelley Patent No. 362,514, *May* 10, 1887.

This Kelley patent shows, in Figures 4 and 5, two somewhat different forms of wheel-rims, each combined with a tire. I call particular attention to the form shown in Figure 5, which is a transverse section of the rim and tire. In this form, the rim proper has a flat bottom and flaring sides. The rim is formed from sheet metal; and the metal of each flange is bent first upward to form the flange, and then downward over the edge of a supplemental rim-member, to form the upper edge of the flange. In this construction (as clearly shown in Figure 5) the flange really consists of three thicknesses of sheet metal; and the upper edge of the flange is formed by bending one thickness of the metal over the edge of another, thus giving the flange a thick, rounded upper edge. The base portion of the tire conforms to the rim-channel. The outer or exposed portion of the tire is approximately semi-circular in cross-section. There is an angular space between each side of the tire and the rounded edge of the adjacent flange. The construction, in this respect, is substantially like that shown in the Elliott patents Nos. 440,701 and 440,702. The Elliott patent No. 440,701 points out the intention of the patentee in employing this construction, to be the prevention of the cutting of the tire on the edge of the flange. This purpose is not pointed out in the Kelley patent under consideration; but the adaptation of the structure to that purpose is evident. One of the drawings of the series which I have had prepared is an enlargement of Figure 5 of the Kelley patent No. 362,514.

The Woodward Patent No. 443,735, *December* 30, 1890.

This Woodward patent relates to improvements in Rims and Rubber Tires for Vehicle Wheels, and shows and describes different forms of rims and tires. I call attention particularly to Figure 3, though all the forms shown in the different figures are quite closely related. Said Figure 3 shows, in cross-section, a rim having a slightly crowning base or bottom and two flaring or outwardly inclined side flanges. The tire shown in combination with this rim has the cross-section of a low or rather flat arch. It is a solid rubber tire, with the exception that it has two longitudinally-extending downwardly-open passageways or spaces extending throughout its entire circumference; or, to describe it in different terms, its cross-section is that of an arch supported at both sides and in the center. Other figures of the drawing show different arrangements of the supporting ribs and the spaces between them; and the specification of the patent states that "the number and width of the ribs will be dependent upon the width of the tire, upon its weight, and

upon the circumstances of the use to which it is to be subjected." Looking at Figure 3, it will be seen that the base of the tire rests on the bottom of the channeled flange; that the base-portion of the tire has two outwardly-inclined sides which fit the inner faces of the flaring flanges; that these inclined sides of the base-portion of the tire do not extend to the upper edges of the flanges, but terminate at some distance below them; that the widest portion of the tire is wholly within the width of the outer portion of the channel; and that there is on each side of the tire an angle which contacts with the corresponding flange, below the edge of the flange. It is apparent that in any compression of this tire its side faces will be pressed against the inclined walls of the adjacent flanges, and cannot be forced into cutting contact therewith, although the specification of the patent does not refer to this characteristic of the structure.

One of the drawings of the series which I have had made is a tracing of Figure 3 of this Woodward patent No. 443,735.

Adjourned to Friday, October 6, 1905, at 10 o'clock A. M.

FRIDAY, *October* 6, 1905—10 o'clock a. m.

Met pursuant to adjournment. Present, as before.
Mr. WILES continuing his answer to Q. 6.

The Woodward Patent No. 481,340, *August* 23, 1892.

This second Woodward patent shows and describes a construction closely resembling that set forth in the earlier Woodward patent, No. 443,735, last above referred to. In the drawing of this second Woodward patent a number of slightly different forms of rims and tires are shown in combination, and I call attention particularly to the structure shown in Figure 3, though all the illustrated structures are much alike. Looking at Figure 3, for instance, it will be seen that the channeled metallic rim has a flat base or bottom portion and two flaring flanges, set at an angle of approximately forty-five degrees to the bottom, and having rounded upper edges. The tire is arch-shaped in cross-section, and is formed with a continuous downwardly open cavity or chamber C extending completely about its circumference. The central portion of the bottom of the tire is flat in cross-section, and is wider than the open lower face of the cavity, so that the side walls of the cavity rest squarely on the flat bottom of the rim. Furthermore, the base-portion of the tire has sides inclined outwardly to conform to the flanges of the rim. The outer or exposed portion of the tire, as seen in cross-section, is bounded by a curve less than a semi-circle; and all parts of the sides of this outer portion of the tire are inclined outwardly from the center of thread. The consequence is that there is at each side of the tire a plainly defined angle or corner at the junction of the side surface of the base portion and the side surface of the exposed portion. This angle or corner, on each side, is practically coincident with the rounded edge of the corresponding flange. The specification of the patent does not mention any purpose of preventing cutting of the tire on the edges of the flange; but each of the figures of the draw-

Woodward.

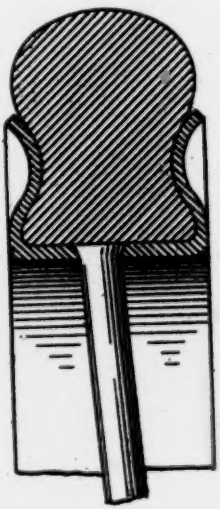
No. 481,340. Aug. 23, 1892.

Fig. 3.

Beiersmith.

No. 424,452. Apr. 1, 1890.

Fig. 1.



ing shows in dotted lines, the position of the tire when under compression; and it will be seen that in these dotted-line positions the tire is obviously protected against cutting on the edges of the rim-flanges.

One of the drawings which I have had prepared, as hereinbefore set forth, is a tracing of Figure 3 of the drawing of this second Woodward patent No. 481,340.

The Beiersmith Patent No. 424,452, *April* 1, 1890.

This Beiersmith patent, which relates to improvements in rubber-tired wheels, shows and describes a rim and tire combined in a way expressly intended to prevent abrasion or cutting of the tire on the edges of the rim-flanges. Figure 2 of the drawing of this patent shows the tire in cross-section, before the assembling of the rim and tire. Looking at this figure, it will be seen that in cross-section the bottom of the tire is flat, the sides of the tire are at right angles to the bottom (except that they are curved inward about midway of the height of the tire), and the top or outer portion of the tire is crowning or rounded. As one step in assembling the rim and tire the tire is seated in the rim, which, at that stage, has a flat bottom and flat sides at right angles to the bottom, as shown in Figure 3. As the final stage in the assembling operation, the side flanges of the rim are corrugated circumferentially, so that the central portion of each flange fits in the curve or depression in the corresponding side of the tire. The specification of the patent described, as follows, the effect of this corrugating operation:

"By reference to Fig. 1 it will be seen that the act of corrugating the rim circumferentially tends to *flare the upper or outer edges E of the sides C to cause the same to extend slightly from the rubber tire, thereby preventing an abrasion of the same and allowing the tire to cushion upon the smooth flare of the rim when compressed by contact with the ground or pavement* and allowing of the inser- it is desired to remove the tire devices for opening the channel when it is desired to remove the tire when worn or fractured.

"In practice I prefer to form the rubber tire with concave sides, as shown, although it will be apparent that I may compress a tire of any desired shape at the central portion when in the act of corrugating the sides C of the rim. I may also form the rim of greater thickness at the central portion than at the edges, if desired, to cause the edges E to flare outwardly more readily."

Looking at Figure 1 of the Beiersmith drawing, which shows the completed rim and tire in combination, it will be seen that there is a clearly shown open angle between the upper edge of each flange and the corresponding face of the tire; and this open angle is de- nded on to prevent abrasion of the tire, by making it possible for the tire "to cushion upon the smooth flare of the rim when compressed by contact with the ground or pavement." This teaching of the Beiersmith patent is in line with the teaching of the Timberlake British patent No. 20,706 of 1890, and the Elliott patent No. 440,702—the expedient adopted by Timberlake, Elliott and

Beiersmith being that of giving the rim and tire such relative shapes in cross-section as to leave an angular space between the edge portion of each rim-flange and the corresponding face of the tire. Timberlake says, in his specification:

"Hitherto cushion tires have often been cut and mutilated by the sharp edges of the rim, and the life of the tire is thereby greatly reduced; *by the peculiar formation of my rim* however this defect is entirely avoided."

Elliott, on the other hand, says, in his specification:

"By making the metallic tire in this manner the rubber tire, when compressed by a direct or lateral pressure, and thereby overlapping the metallic edges *b'*, will not be cut or injured by said edges, while said edges are made sufficiently high to properly reinforce the rubber tire."

We have now, in addition to these statements, the statement of the Beiersmith specification, that the act of corrugating the rim circumferentially tends to flare the upper or outer edges of the sides or flanges thereof, *"to cause the same to extend slightly from the rubber tire,* thereby preventing an abrasion of the same and allowing the tire to cushion upon the smooth *flare of the rim* when compressed by contact with the ground or pavement." These three patents obviously afford a complete disclosure of that principle or feature of construction involving such relative forms of the rim and tire as to leave angular spaces between the edges of the rim-flanges and the adjacent faces of the tire—the definitely stated purpose of providing such angular spaces being to prevent abrasion of the tire upon the edges of the flanges, "when compressed by contact with the ground or pavement."

It is to be observed, with reference to this Beiersmith rim and tire, that the open angle between the edge of each rim-flange and the corresponding side face of the tire is due to two facts—first, the fact that the upper or outer portion of each flange flares outwardly, and, second, the fact that each flange is extended outwardly beyond its outermost line of contact with the face of the tire. The figures of the drawing of the Beiersmith patent are on a small scale, and if a structure was made in exact accordance with Figure 1 of said drawing, except that a narrow strip (say, one-sixteenth of an inch wide) was cut away from the edge of each flange throughout its entire circumference, the open angle between the flange and tire would disappear, each side of the tire would make direct contact with the edge of the flange, and the protection against abrasion of the tire against the edge of the flange would be gone. On the other hand, it is apparent that any addition to or extention of the flaring edges of the rim-flanges would correspondingly increase the cross-section of the angular space between each flange and the corresponding face of the tire, by increasing the width and depth of such angular space.

In view of the disclosure of the Timberlake, Elliott and Beiersmith patents, what possible invention could there have been, at the time of the application for the Grant patent in suit, in giving the rim and the tire combined with such relative shapes in cross-section as to leave an open angular space between the edge portion

of each flange of the rim and the corresponding face of the tire? The desirability of such angular spaces was made matter of common knowledge by these patents; and the Beiersmith patent clearly taught that in any structure in which the rim-flanges (or the outer parts of said flanges) were outwardly flaring, all that was necessary to produce the open angular space on either side of the tire was to extend the flange beyond its outermost line of contact with the tire. In my judgment, the adoption of this expedient, at the date of the application for the Grant patent in suit, was merely the exercise of ordinary mechanical skill and common sense; and its adaptation to the Grant construction involved nothing beyond the teachings of the Beiersmith patent. That is to say, Grant chose to use a rim having flaring flanges—an old and perfectly well known construction. In this rim, he seated a tire having its base portion conformed to the rim-channel—another old and perfectly well known feature of rim-and-tire construction. Had he made the flanges of his rim of very slightly less width than that shown in the drawing of his patent, so that the edge of each flange was the outermost line of contact of the flange with the corresponding face of the tire, no angular space would have been left between the flange and tire on either side; and the purpose of preventing abrasion would have been defeated, so far as the relation of the rim and tire was concerned. He might have made his structure in that way; but, following the teaching of the Beiersmith patent, he extended the flaring flanges outward beyond the outermost line of contact of each flange with the face of the tire, thereby presenting the open angular spaces between the flanges and tire which are shown in the drawing of the patent and are recited in both claims of the patent in the description of the angles or widest portions of the tire as "being located within the outer periphery of the flanges." It seems to me to be demonstrated that in adopting this old expedient, neither invention nor any marked degree of mechanical skill was required, in view of the teachings of the patents to which I have referred.

One of the drawings of the series which I have had prepared for illustrative purposes, is an enlargement of Figure 1 of the drawing of this Beiersmith patent No. 424,452.

While I am on this subject, I may conveniently refer for a moment to the wheel marked "Complainants' Exhibit No. 3, Defendant's Rubber Tired Wheel," which was submitted to Mr. Livermore for comparison with the claims of the Grant patent in suit. I do this at this time, as illustrating Mr. Livermore's judgment as to the amount of open angular space between each rim-flange and the side of the tire required to bring a given structure within the contemplation of the Grant patent and its claims. It will be seen that while this wheel-rim and tire are on a considerably larger scale than Figure 2 of the drawing of the Grant patent, they nowhere show an open angular space of such cross-sectional size as the open angular space shown between either side of the tire and the corresponding rim-flange in the drawing of the Grant patent. In fact, throughout a very large portion of the circumference of this wheel exhibit the "corners" of the tire are flush with the edges of the flanges, so that

no open angular space whatever is presented; and throughout the remainder of the circumference the "corners" are but slightly "within the outer periphery of the flanges."

The Willoughby British Patent No. 18,030 *of* 1892.

I refer to this British patent, first, because it shows a metal rim of the same cross-section as that of the Grant rim of the patent in suit; second, because this rim is combined with a rubber tire fitting within the rim-channel; and, third, because the thick edges of the rim are rounded, so that any movement of the rubber of the outer portion of the tire would merely lap it upon one or both of said rounded surfaces, and would have little, if any, tendency to cut the tire. The rim shown in this Willoughby patent is only one of a number to which I have referred as having flaring flanges; and all these patents show that at the time of the application for the Grant patent such a flaring, channeled rim was a perfectly well known element, in combination with rubber tires.

I might add that in this Willoughby British patent, the rubber tire (which is seated in the rim) is shown as overlaid by protecting armor made up of metal plates,—this armor being extended completely about the circumference of the wheel, and being held in place by means of a metal strip threaded through the plates, or by means of two wires threaded through the plates and serving as retaining-wires. Figures 15 and 16 of the drawing of the Willoughby patent in question are cross-sections, one showing the employment of a retaining-strip *f*, and the other showing the employment of two retaining-wires *f*. This disclosure is interesting merely as affording another instance of the interchangeability of a flat band and a pair of independent retaining-wires, as a means for holding a rubber tire in its place in a channeled rim of any desired cross-section.

One of the drawings of the series which I have had prepared comprises tracings of Figures 15 and 16 of the drawing of the Willoughby British patent No. 18,030 of 1892.

I wish now to call attention to certain patents of the prior art showing rubber tires in which the outer portion has side faces converging from the base toward the tread—the lateral thickness of the tire being least at the tread and increasing toward the base or seating portion. This is one of the principal features of construction of the tire of the Grant patent in suit,—the purpose of adopting this shape or cross-section, being to prevent the spreading of the rubber of the tire beyond the lateral limits of the rim, when the tire is under the compression of use. There are a number of patents of the prior art showing tires having this general type of cross-section, and the first one to which I refer is,—

The Lenton British Patent No. 14,812 *of* 1890.

This Lenton patent, which relates to improvements in Tires and Rims for Velocipedes and Other Carriages, shows a number of slightly different forms of rims, combined with corresponding forms

Willoughby. (British)
No. 18.030 of 92.

Fig. 15.

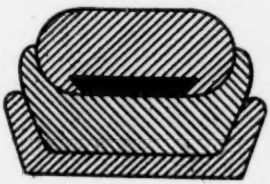
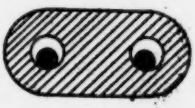


Fig. 16.



Lenton. (British)
No. 14,812 of 90.
Fig. 4.

of tires. I quote from the specification of the patent the description and explanation of the general construction contemplated in the patent, and I call attention to Figure 4, as one exemplification of the construction in question. The portion of the specification which I desire to quote is as follows:

"I construct my improved tire from 'caoutchouc' india-rubber, or elastic material partaking somewhat in outline cross-section of the 'heart' or 'pip' shape, the upper part being a segment of two circles, united together; and the lower, the bearing surface. Two cells or chambers run circumferentially of the tire, and are situated about centrally of the segmental parts above named. The rim in cross-section is as a segment of two circles united together also, to receive the upper part of the tire (and secured in any manner) and may be termed 'duplex' or double-rim; *the edges of which are brought outward and in some cases rolled over, so that the cutting action of the tire of the ordinary air-cushioned or pneumatic is prevented.*

"*According to the construction of my tire as above set forth there is no tendency to overlap the rim,* the action of the superincumbent weight being rather to press the rubber well into the hollows of the rim, and to prevent it from springing off as might happen with a tire and rim of spherical section," etc.

It will be noticed that in the drawing of this patent the rim is shown above the tire, in the section views, instead of being shown below the tire, as in the drawings of nearly all the patents to which I have heretofore referred. For this reason, the specification refers to the base, or seated, portion of the tire as the "upper part" thereof, instead of calling it the "base-portion" or the "bottom portion," or the like.

Looking at Figure 4, it will be seen that the rim has the peculiar cross-section described in the specification; that the flanges of the rim are flared or inclined outward; that the edge of each of the flanges is rounded or "rolled over," as suggested in the specification; that the base portion of the tire fits the channeled rim and has outwardly-inclined or flared side faces; and that the exposed portion of the tire has it sides inclined inward from the base toward the center of the tread, so that the tread is the narrowest portion of the tire. It will be seen that in the structure of Figure 4, the widest portion of the tire is just within the outer periphery of the flanges; that there is a slight angular space between the edge of each rim and the corresponding side of the tire; and that in any compression of the tire there is, as the specification of the patent states, "no tendency to overlap the rim."

This Lenton British patent is a complete disclosure of the expedient of narrowing the outer portion of the tire from the rim toward the center of the tread, so that the narrowest part of the tire is at the tread,—the purpose of the expedient being to prevent overlapping of the rim by the rubber of the tire in the compression of use. This is exactly the advantage of the peculiar section of the outer portion of the Grant tire, pointed out in the patent in suit; and it is obvious that in giving the Grant tire such a cross-section, for

the purpose proposed, Grant did nothing more than to follow the teaching of this Lenton British patent of 1890.

The Lenton patent not only shows this peculiar cross-section of the outer portion of the tire, but it also illustrates the expedient of giving the rim and tire such relative shapes as to leave an angular space between the edge of each rim-flange and the corresponding face of the tire. That is to say, the Lenton tire and rim are an embodiment of both the expedients for preventing abrasion of the tire on the edges of the rim-flanges; and it distinctly points out the functions of these two expedients. The angular space between each rim-edge and the corresponding wall of the tire is not great, as shown in the Lenton patent; but it is sufficient to afford a basis for the statement in the specification that the cutting action of the tire is thereby prevented. Furthermore, I should say it was fully as good an illustration of the angle between the flange-edge and the tire as is afforded by the wheel marked "Complainants' Exhibit No. 3, Defendant's Rubber Tired Wheel," which Mr. Livermore finds to be an exemplification of the claims of the patent in suit. In my judgment, the Lenton tire and rim, taken alone, are sufficient to show that Grant exhibited no invention whatever in choosing the shape of his rim and tire, for the purpose of preventing abrasion of the tire on the edges of the rim-flanges.

It may be urged that the Lenton tire, as shown, is not held in place in the rim by retaining-wires. The drawing of the patent shows no such tire-fastening; and the specification merely states that the tire is secured to the rim "in any manner." In my judgment, this is of no consequence whatever. The relative cross-sections of the rim and tire co-operate in precisely the same way to prevent abrasion of the tire on the edges of the rim-flanges, no matter how the tire may be held in place in the rim; and the Lenton patent is precisely as pertinent as it would be if retaining-wires were threaded through the openings in the tire and had their ends joined so as to form the independent, endless retaining-wires of the Grant patent, or of any of the many prior patents to which I referred as showing such retaining-wires.

One of the drawings of the series which I have had prepared is a tracing of Figure 4 of this Lenton British patent of 1890.

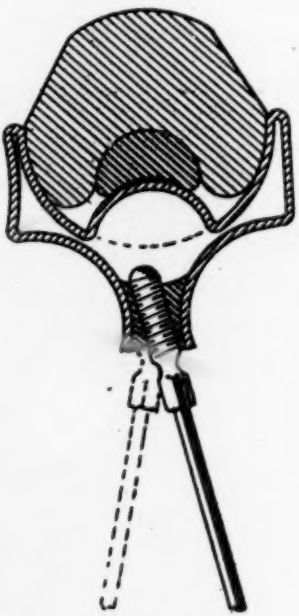
The Owen Patent No. 365,091, *June* 21, 1887.

This Owen patent shows, in sheet 1 of the drawings, cross-sections of a number of different forms of metal rims and rubber tires. Figures 1 to 8 all show channeled rims having outwardly-flaring flanges; and each of the figures shows a tire having its base-portion of such cross-section as to conform substantially to the rim-channel. The outer or exposed portions of the tires differ greatly in cross-section,—a number of them having the contour of single arcs of circles, generally approximating semi-circles. That is to say, the outer or exposed portions of a number of these tires are of the same cross-section as the outer portion of the Latta tire of patent No. 341,811. The tires shown in cross-section in Figures 5, 6 and 7,

Owen

No. 365,091. June 21, 1887.

Fig. 6.



however, have their outer or exposed portions of such cross-section that the narrowest portion of each of them is at the tread,—the sides of each tire being inclined outward from the tread toward the rim. In Figure 5 the actual tread portion is convex, while the outwardly-inclined sides are concave. In the tire shown in Figure 6, the actual tread portion is convex, while the sides are outwardly-inclined planes. In the form shown in Figure 7 the actual tread is convex, and each of the sides, as seen in cross-section, has the contour of a reverse curve. In each of the forms, the widest portion of the tire is within the outer periphery of the rim-flanges, the narrowest portion of the tire is at the tread, the sides of the exposed portion of the tire are inclined outwardly from the tread to the rim, and each of the sides of the exposed portion forms an obtuse angle with the corresponding side of the base-portion—this angle being just within the periphery of the corresponding rim-flange. This general form of the tire shown in Figures 5, 6 and 7 is not accidental, but has a purpose, which is clearly set forth as follows in the specification:

"In bicycles and tricycles as commonly constructed the soft rubber tire seated in the grooved rim projects beyond the same in a semi-circular or approximately semi-circular form. As a result of this construction, it is found in rolling over the ground under pressure the tire is expanded laterally, so that it projects beyond the edges of the rim and is sheared or cut off thereby. *To avoid this difficulty I reduce the width of the tire outside of the rim or felly, making its size either of a flat or concave form, or of other form falling within the semicircle, so that when subjected to pressure the lateral expansion or enlargement will not cause the tire to project beyond the rim.* This construction is plainly shown in Figs. 5, 6 and 7." (The word "size" in this quotation should evidently be "sides.")

In view of this Owen patent, how could there have been any possible invention, at any time after June 21, 1887, in substituting a tire having the external cross-section shown in Figure 5, Figure 6 or Figure 7, for a tire having the external cross-section shown in Figure 1 or Figure 2 of said Owen patent. In other words, what possible invention could there have been, at any time after the date of the Owen patent, in substituting a tire having the external cross-section shown in Figure 5 or Figure 6, or Figure 7, of the Owen patent, for the tire shown in the Latta patent No. 341,811, a tire whose outer portion has the cross-section shown in Figure 1 or Figure 2, or Figure 3, of the Owen patent? It is perfectly obvious that such a change of the form of the tire shown in the Latta patent could not possibly involve any invention, nor could the improvement of the Latta tire due to such change of form, be possibly made the basis of a patent, since this improvement was disclosed by Owen, and fully explained in his patent. It is apparent that the patents to which I have referred fully disclose and explain the expedients which Grant adopted for the purpose of preventing abrasion of the sides of his tire against the edges of the rim-flanges under the compression of use. The whole matter was fully understood before

Grant entered the field. The possibility of making an invention by adopting these expedients had passed away. Grant used them, just as they had been used and disclosed by others before him; and the fact that he used them in a construction wherein the tire was held in the rim by means of retaining-wires has no effect whatever on the question whether or not he made an invention. The use of these expedients is the same, and the purpose of these expedients is the same, whatever means are employed for holding the tire in the rim. It is perfectly apparent that the Grant tire and rim derive no novelty from their relative cross-section; and it is equally apparent that the purpose and effect of the expedients which Grant adopted for preventing cutting of the faces of the tire on the edges of the rim-flanges is in no way affected by the nature of the means whereby the rim and tire are held together.

One of the drawings of the series which I have had prepared is an enlargement of Figure 6 of the Owen patent No. 365,091.

The Kearsley British Patent, No. 4352 *of* 1883.

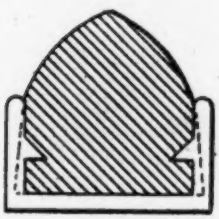
This patent relates to improvements in the Rubber Tires and Rims of Carriages and Other Vehicles, and it shows in its drawing a number of different forms of rims and tires. In the form shown in Figures 2 and 3, the metal rim has a flat base or bottom and two side flanges at right angles to the bottom, and having their upper edges rounded. The tires shown in these two figures have their base portions fitted to the rim-channel, and their exposed portions gradually narrowed inward from the rim toward the center of the tread. In the form shown in Figure 2, the cross-section of the exposed portion of the tire has curved, slightly convex, converging sides. In the form shown in Figure 3, the actual tread is slightly convex, and the inclined sides are flat. The outer portion of the tire shown in Figure 3 has substantially the same cross-section as the outer portion of the tire shown in the Lenton British patent of 1890 above considered; and it is apparent that the narrowing of the exposed portion of the tire would have the effect pointed out in the other patents to which I have referred, though the Kearsley specification does not refer to it. All the tires shown in the drawing of this Kearsley patent are held in the rims by means of internal spurs or ribs on the rim-flanges.

One of the drawings which I have had prepared is a tracing of Figure 2 of the Kearsley British patent.

The Coops Design Patent, No. 20,678, *April* 14, 1891.

This Coops design patent simply shows a rubber tire in cross-section; and this cross-section closely resembles the cross-section of the Grant tire of the patent in suit, or the cross-section of the Owen tire of Figure 6 of the Owen patent No. 365,091. The patent being merely for the design, no rim is shown, nor is there any suggestion in the patent as to the relation of the tire to the rim, or the means

Kearsley (British
No. 4352 of 83.
Fig. 2.



Coops

Design No. 20,618. Apr: 14, 1891.

for holding the tire in place in the rim. In view of the Owen patent, for instance, or in view of the information contained in the various other patents of the prior art to which I have referred, there could obviously have been no difficulty, at the time of the Grant application for the patent in suit, in combining a tire of this Coops cross-section, with a suitable rim.

One of the drawings which I have had prepared is a tracing of the drawing of this Coops design patent.

In view of the various patents of the prior art which I have discussed, and for the reasons which I have given in detail in considering these patents, it seems to me to be demonstrated that the Grant patent disclosed nothing novel, and that the production of the Grant rim and tire involved no invention. There was no novelty whatever in the rim employed by Grant; and he merely selected that particular rim from a number having the same general characteristics. There was no novelty in conforming the base-portion of the rubber tire to the shape of the rim, for that was a common feature of construction in the art. There was no novelty whatever in fastening the tire in place in the rim by means of independent, endless retaining-wires passing circumferentially through the rubber tire. That was a well-known expedient in the art; and Grant merely adopted that, instead of selecting some other equally well-known means of fastening the tire in place. The general shape of the rim, the conformation of the tire to the rim, and the employment of independent, endless retaining-wires, passing circumferentially through the rubber tire, and located within the rim-channel, were all present in a single structure of the prior art,—namely, the structure shown in the Latta patent, No. 341,811. There was nothing new in so shaping the outer portion of the rim and the exposed portion of the tire as to leave an open angular space between the edge of each rim and the corresponding side of the tire, for the purpose of preventing abrasion of the tire on the edges of the rim. That expedient was not only old, but was clearly explained in patents of the prior art, so that its utility and desirability were fully understood before Grant entered the field. There was nothing new in forming the outer or exposed portion of the tire with inclined sides diverging from the tread toward the rim, for the purpose of preventing the spreading of the rubber of the tire beyond the edges of the rim, under the distorting pressure of use. That had all been discovered, disclosed and clearly explained in the prior art long before Grant devised his rim and tire. Not only was this expedient old and explained in the prior art, but in one instance, it was disclosed in a patent (the Owen patent, No. 365,091) which showed a tire of this peculiar construction side by side with another tire having its exposed portion semicircular in cross-section, thus making it obvious to the most casual student that either form might be substituted for the other. Not only that, but the tire having its outer portion semicircular in cross-section was, in that respect, practically identical with the tire of the Latta patent No. 341,811, so that the Owen patent, taken in connection with the Latta patent, was sufficient to unmistakably suggest that the outer portion of the Latta

tire might be given the cross-section in which the sides diverged from the tread to the rim, for the purpose and with the result set forth in the Owen patent. Furthermore, the cross-section of the outer portion of the tire, and the relation of that cross-section to the rim, as bearing upon the prevention of the cutting of the tire on the edges of the rim-flanges, is a matter wholly independent of any peculiar shape of the base-portion of the rim, the conformation of the base-portion of the tire thereto, and the means employed for fastening the tire in the rim. The production of the Grant rim and tire of the patent in suit was merely the aggregation of well-known features of construction chosen from the prior art, and involved no invention whatever.

Adjourned to Saturday, October 7, 1905, at 10 o'clock a. m.

SATURDAY, *October* 7, 1905—10 o'clock a. m.

Met pursuant to adjournment.
Present as before.

Mr. WILES, continuing his answer to Q. 6:

Mr. Livermore, the expert who has testified on behalf of the complainants herein, after describing the shape of the outer or exposed part of the tire, devotes a portion of his deposition to a consideration of the location of the retaining-wires, the shape of the base or seated portion of the tire, the corresponding shape of the rim, and the operation due to the arrangement of these parts. A portion of this consideration is purely descriptive, and need not be repeated here; but his discussion of the operation is interesting, and I quote it in full, as follows:

"Under the conditions in which rubber tired vehicle wheels are used, they are liable at any time to be subjected to violent transverse strains, as when a wheel slews, or, for example, crosses a car track at a rather acute angle, and such strain tends to tear away the rubber or to dislodge it from the wheel rim, and if the strain were entirely concentrated at the point of application, it would be liable to tear away the rubber from its fastenings, or to dislodge it from the wheel rim so that the rubber, even though untorn, might come off the wheel, or might fail to reseat properly in the channel, and thus be subjected to excessive wear by reason of its improper position relative to the channel.

"*The arrangement of the fastening wires shown in the Grant patent* provides an elastic cushion of rubber between each wire and the bottom of the channel in the rim, and any strain tending to lift the tire, or to tip it laterally in the rim is resisted by the fastening wire at that point, while the fastening wire itself is yielding on the cushion of rubber between it and the bottom of the channel extending entirely around the wheel. Therefore, the strain instead of being resisted by an unyielding fastening, meets a yielding resistance and is distributed so that the point at which the strain is directly applied does not have the entire strain concentrated upon it, and is not so liable to tear or break away from the fastening as it would be if such yielding action were not provided for the fastening itself.

"*By having the fastening wires independent of one another,* one of them may yield to relieve the strain at that point, when, as is usually the case, there is a tendency of one side of the rubber to rise from the bottom of the channel while the other side remains at the bottom of the channel. Thus, the fastening which is principally subjected to the strain may yield to distribute that strain, while the other fastening remains unaffected and tends to prevent the complete dislodgement of the tire from the rim.

"*The outwardly flaring form of the channel and corresponding form of the unexposed portion of rubber seated therein,* admits of such yielding side rocking of the rubber or the rise of one side slightly from the bottom of the channel, as is necessary to relieve the strain at that point, and then admits of and facilitates the reseating of the rubber or its return to a normal position in the bottom of the channel as soon as the dislodging strain has ceased to act."

Assuming that this is perfectly correct and that the lifting of the retaining-wire at either side, the lifting of the corresponding side of the tire, and the return of the wire and tire to normal position, constitute, in fact a useful and valuable feature of operation of the Grant tire, I call attention to the fact that this operation is due to the three features of construction specified by Mr. Livermore in those parts of the above quotation which I have underscored. The first of these features of construction is *the arrangement of the fastening wires shown in the Grant patent,*—that is, the arrangement whereby there is provided "an elastic cushion of rubber between each wire and the bottom of the channel in the rim." The second of these features of construction is *the independence of the fastening wires,* which is such that "one of them may yield to relieve the strain at that point, when, as is usually the case, there is a tendency of one side of the rubber to rise from the bottom of the channel while the other side remains at the bottom of the channel." The third of these features of construction is *the outwardly-flaring form of the channel and corresponding form of the unexposed portion of rubber seated therein,* which, according to Mr. Livermore's statement, permits one side of the rubber to rise slightly from the bottom of the channel under lateral strain, and then permits it to reseat itself, or return to normal position in the bottom of the channel. None of these characteristics (the arrangement of the fastening wires, the independence of the fastening wires, and the outwardly flaring form of the channel and corresponding form of the unexposed portion of rubber seated therein) are in any way dependent upon the shape of the outer or exposed portion of the tire; and assuming that Mr. Livermore's explanation just quoted is entirely correct, the operation which he describes would take place in exactly the same way, and to exactly the same extent, if the outer, exposed portion of the tire had a semicircular contour in cross-section, like that, for instance, shown in either of the Kelley patents or in either of the Elliott patents hereinbefore referred to. Mr. Livermore's own statement as to this theory of operation is sufficient to show that the shape of the exposed portion of the tire is in no way concerned in it and has no effect upon it; and it is apparent that this mode of operation, on which Mr.

Livermore apparently bases any claim for the novelty of the Grant tire, is wholly independent of the presence or absence of the peculiar cross-sectional shape of the outer portion of the tire. In other words, the arrangement of the wires, the independence of the wires, and the shape of the rim and seated portion of the tire have one operative function; the shape of the outer portion of the tire has another operative function; the two functions are independent of each other; and either of them would take place equally well without the other.

Turning now for a moment to the Latta patent, No. 341,811, it will be seen that Mr. Livermore's quoted discussion of this theory of operation applies absolutely to the Latta rim, tire and retaining-wires. The arrangement of fastening wires, the independence of the fastening wires, the outwardly-flaring form of the channel and corresponding form of the unexposed portion of rubber seated therein, are all the same in the Latta structure as in the Grant structure, so far as any test of Mr. Livermore's theory of operation is concerned. If the Grant tire operates, in this respect, in the way pointed out by Mr. Livermore, the Latta tire will operate in exactly the same way; and the operation of either of the tires, in this regard, will obviously be wholly unaffected by the shape of the outer portion of the tire. If Mr. Livermore's theory of operation, set forth in the above quotation, is correct then the Latta patent discloses a structure adapted to exemplify it; and the Grant patent adds nothing whatever to that disclosure.

In an early part of this answer, I quoted Mr. Livermore's discussion of the Latta patent, in his deposition in the suit of *The Rubber Tire Wheel Company v. The Goodyear Tire & Rubber Company et al.* A portion of that discussion is as follows:

"As appears from the above description, this fastening" (meaning the Latta retaining-wires) "is totally different in nature from Grant's non-stretchable wires, and *there is no co-operation between Latta's wires each performing its own function in co-operation with the other*, as in Grant's tire, but Latta merely has a plurality so that when one breaks others will be left to do the work. The Latta longitudinally elastic wires would be totally inadequate to keep a carriage wheel tire in place, and *there is no suggestion of yielding to relieve and distribute the strain* as takes place in Grant's tire. This is evidenced by the following statement in the Latta patent: 'It is obvious that the tire may be secured in its seat by cement in the usual way if desired.'"

I see no possible reason for Mr. Livermore's assumption that the Latta wires would not have the same co-operative action as the retaining-wires of the Grant tire. It appears to me that the two structures are alike, as to any such co-operative function; and if the wires of the Grant tire operate in the way pointed out by Mr. Livermore, the wires of the Latta tire must have a similar operation. The inference drawn by Mr. Livermore from the statement in the Latta patent that, "It is obvious that the tire may be secured in its seat by cement in the usual way if desired," is apparently unwarranted. Figure 5 of the drawing of the Latta patent shows the combination of the rim, the tire *and the retaining-wires*. Figure 6 shows a rim

and tire *without retaining-wires*,—the tire being apparently "secured in its seat by cement in the usual way."

Mr. Livermore points out the fact that in the Latta patent "there is no suggestion of yielding to relieve and distribute the strain," as if that fact precluded the possibility of any such operation of the retaining-wires of the Latta tire. It is true that the Latta specification sets forth no such theory of operation as that explained by Mr. Livermore in his deposition herein; but it is equally true that the Grant patent in suit contains no reference whatever to any such mode of operation, and nowhere suggests the possibility of any such co-operative action of the retaining-wires as that pointed out by Mr. Livermore. If this mode of operation is one of the inherent possibilities of the Grant structure, there is certainly nothing in the patent to show that the patentee or his solicitor had any knowledge of it. The patent does not suggest it as one of the advantages of the illustrated structure, or refer to the shape of the rim and the seated portion of the flange, or to the location of the retaining-wires, or to the independence of the retaining-wires, as intended or adapted to contribute to this possible co-operative action explained by Mr. Livermore. In fact, the Grant patent is in the same position as the Latta patent, so far as any disclosure of Mr. Livermore's theory of operation in question is concerned.

In the opinion in the suit of *Rubber Tire Wheel Company v. Columbia Pneumatic Wagon Wheel Company*, his Honor, Judge Thomas, referred as follows to this theory or mode of operation:

"The two wires pass through the rubber longitudinally, in openings which are below the edges of the flanges, and on a line with the vertices of the angles made by the unexposed and exposed sides of the tire; and the ends of each wire are fastened together, after having been drawn *sufficiently tight to hold the rubber within the channel, but not so rigidly as to prevent the rubber moving slightly in its seat*, and thereby to a degree yielding to any force opposing the progress of the wheel. This latitude of movement, together with the elasticity of the rubber, permits the tire to accommodate itself to the obstacles with which it comes in contact when the wheel is in motion."

It is perfectly apparent that the Grant patent contains no directions or instructions whatever in relation to the degree of tension to be put upon the retaining-wires, in order to make them "sufficiently tight to hold the rubber within the channel, but not so rigidly as to prevent the rubber moving slightly in its seat;" and if the degree of tension is essential (as would appear from the statement of Judge Thomas), it must evidently be left to the judgment of the workman, based on some information outside of the disclosure of the patent. The Latta patent No. 341,811, was not before the court in the Columbia Pneumatic Wagon Wheel Company suit, in which Judge Thomas rendered the above opinion; and, in my judgment, if that patent had been brought to the attention of the court, it would have been seen that if the Latta retaining-wires were brought to the tension thus defined (that tension having been determined by the skill and experimental knowledge of the workman), the Latta tire would present the same mode of operation pointed out in the opinion. That is to say, it would have been seen that the de-

scribed mode of operation of the Grant tire (not pointed out in the Grant patent), if actually possible and practicable, was in no way novel, since it was an inherent possibility of the Latta tire. It is true that the Latta patent gives no directions for tightening the retaining-wires to the degree of tension defined in the opinion of the court in the Columbia case; but neither does the Grant patent give any such directions; and if the mode of operation is dependent upon the skill and information of the workman, and not upon any directions in the patent, the disclosure of the Latta patent stands on the same footing in this respect as the disclosure of the Grant patent, and is entitled to the same consideration.

In the later suit of *Goodyear Tire & Rubber Company et al. v. Rubber Tire Wheel Company et al.*, in the Circuit Court of Appeals of the Sixth Circuit, the court discussed the prior art in detail, and also considered carefully and at length this matter of the mode of operation pointed out by Mr. Livermore. Without reciting that discussion in full, I wish to quote, continuously, the latter part of it, as follows:

"The old art, say counsel, taught the necessity of a very secure attachment of the rubber in its rim. The inventor, according to the claims now made by him, turned his back upon all the teachings of the old art in this matter and struggled to secure his rubber so that it should hold its place and yet should be capable of some side movement as a means of yielding to violent side blows, instead of persistently resisting at the expense of a torn rubber or a broken wire.

"We learn now that this capacity for any beneficial yielding is dependent upon the wires being properly adjusted originally, and that this proper tension depends upon the right judgment of the workman.

"If this tipping capacity had been pointed out and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved, though this we need not consider. But neither the advantage of such a function nor any hint that it is in anywise dependent upon the normal tension of the retaining wires is to be found in the patent.

"How, then, is it possible for the public to obtain a knowledge of this new function, its advantages, or how best to secure the proper tension of the wires to allow of this capacity?

"If it exists in Grant's arrangement of old parts it is an accidental mode of operation dependent upon the normal tension of the retaining wires in the particular tire.

"It is the duty of a patentee to disclose his invention that the public may be able to practice it when the monopoly expires.

"This disclosure should include the mode of operation as well as a method of construction. Grant has not disclosed this alleged capacity of his structure for rising or yielding on one side under severe lateral strain, nor has he disclosed any method of securing same by the proper arrangement of the retaining wires to produce the proper tension upon which this capacity in any beneficial sense depends.

"Eliminating this alleged new feature we are unable to find in

Grant's combination any new mode of operation or any new result. As was said about another inventor in another case, Grant has shown great industry in acquiring knowledge of what others had done or taught in the attempt to make a marketable rubber-tire wheel, and has shown good judgment in selecting from earlier structures or earlier teachings the best of the devices thus made known, and good judgment in combining them with mechanical skill. But we can discover no trace of invention or original thought, for his parts as combined do substantially the same operations which they did in the combinations from which he took them."

Adjourned, by agreement, to Thursday, October 12, 1905, at 10 o'clock a. m.

THURSDAY, *October* 12, 1905.

Met pursuant to adjournment. Present as before.

Mr. WILES continuing his answer to Q. 6:

The conclusion of the Circuit Court of Appeals that if the alleged new mode of operation of the Grant tire (that is, the alleged possibility of the yielding of the retaining-wire at that side of the tire to which lateral pressure is applied) is eliminated from consideration, the Grant structure presents no new mode of operation or new result, seems to me to be clearly and obviously correct. The shape of the external portion of the tire has nothing whatever to do with this alleged mode of operation; and the bringing together in a single structure of the particular external tire-section shown in the Grant patent, with the rim tire-base and retaining-wires adapted to have the alleged new method of operation, is obviously a mere aggregation of features of construction. It is evident therefore that no patentability of the entire structure can be based upon the fact that it embodies these merely aggregated, independent features of construction.

The conclusion of the Circuit Court of Appeals in this regard seems to me practically undeniable.

It will be seen that, in the opinion of the Circuit Court of Appeals, the alleged new mode of operation of the Grant tire is finally eliminated from consideration, for the reason that it is in no way pointed out in the specification of the Grant patent; that no hint of any such possible mode of operation, or its advantage, appears in the specification; and that the specification of the patent contains no directions, definite or indefinite, intended to enable the workman to give the retaining-wires such tension as may be required to enable them to hold the tire in place and at the same time to yield to lateral pressure in the alleged new mode of operation pointed out by Mr. Livermore. In his deposition in this suit, Mr. Livermore apparently attempts to remove some portion of this objection, by saying, in effect, that no directions to the workman, and no knowledge of the workman on this point, are required—it being simply necessary to give the retaining-wires sufficient tension to hold the tire against displacement, or any other further tension within the breaking strain of the wire. In order to make his position perfectly

clear, I quote from his deposition, Q. 6 and the answer thereto, in relation to this matter, that question and answer being as follows:

"Q. 6. Assuming the construction to be such as is shown in the Grant patent, is it your opinion that the qualities which you have termed 'inherent qualities of the tire' would be destroyed by an abnormal tightening of the wire?

"A. It is my opinion that the wires cannot be tightened so excessively as to impair the action described by me as resulting from the relation of the wires to the rubber and rim. With the usual proportions such as are indicated in the Grant patent and such as would naturally be followed by a competent constructor, the tensile strength of wire of a good quality of steel such as would naturally be used is not sufficient to admit of the wires being so tightened that they would not yield by reason of the cushion of rubber between them and the bottom of the channel to an outward strain tending to dislodge the rubber from the rim sufficiently to distribute the said strain or prevent its concentration upon the fastener at the point where the strain is applied."

Assuming this to be correct, it means that whenever the endless retaining-wires of the Grant structure are under sufficient tension to hold the tire securely in its rim (or under any greater tension within the strength of the wires), the yielding of the retaining-wire at either side of the tire to the strain of lateral pressure applied to that side is an inherent possibility of the structure, and may take place whenever the lateral strain is sufficient. If this is true in relation to the Grant tire, it must be equally true of the Latta tire of patent No. 341,811, for instance; and it is obvious that in the use of a tire-structure like that shown in said Latta patent, all that is necessary to provide for carrying out the mode of operation described by Mr. Livermore is to give the endless, independent retaining-wires such tension as is necessary to hold the tire securely in its rim—the possibility of such mode of operation being still present if the wires are given any extra tension, within the limit of their strength. Neither the Grant patent nor the Latta patent gives any instructions whatever as to the degree of tension the wires should have in order to make their respective structures operative; but I think it may be fairly assumed that each of the patents contemplates the application of such tension as will hold the tires in the rim, and also that the discovery and application of such tension may be left to experiment and the skill of the workmen. The two patents are on the same footing, in this respect; and if the mode of operation pointed out by Mr. Livermore does not depend on the fixing of any maximum limit of tension of the retaining-wires in any given case, then the Latta patent is as much a disclosure as the Grant patent, of the practice of this method. In my judgment, the Latta patent alone is sufficient to eliminate the alleged method of operation of the Grant tire from consideration, in determining the novelty of the Grant tire; and I fully agree with the Circuit Court of Appeals of the Sixth Circuit, that "eliminating this alleged new feature," the Grant structure presents no patentable novelty. In my judgment, it presents no invention or patentable novelty whatever.

Cross-examination by Mr. STALEY:

X Q. 7. Do you claim to have any practical knowledge of this art, as constructor, or as the result of any practical work in rubber tires, or has your testimony been from the standpoint of a theoretical expert?

A. I have had no experience whatever in relation to the manufacture or use of rubber tires of the general type under consideration in this case.

X Q. 8. Having gone over the art as you seem to have done, as it appears in the paper exhibits introduced here, which one of these various devices exhibited in these prior patents or publications, would you say closely approximates the Grant structure as set forth in the patent in suit, and I desire, if possible, to confine your answer to one single device?

A. My deposition, as given thus far, shows very clearly that I regard the Grant structure as embodying various features of construction, some of which are wholly independent of the others. Without going into details which have been fully set forth in my direct examination, I may say that, assuming that the rim, the base of the tire and the endless, independent retaining-wires have a certain co-operative relation, any joint action which they may have is not affected by the shape of the external or exposed portion of the tire. In my judgment, therefore, it is immaterial whether any single prior patent shows a rim, tire-base, and independent, endless retaining-wire, and at the same time shows the external tire-section shown in the Grant patent. In the course of my direct examination, I referred to several patents, each showing the combination of a rim, a tire seated in the rim, and independent, endless retaining-wires passing longitudinally through the tire, and intended to hold the tire in place on the rim. I should say that the best instance of this combination appears in the Latta patent, No. 341,811, of May 11, 1886, though the various other patents showing the same general combination which have been pointed out in the course of my direct examination may be referred to as further illustrations.

That there is no novelty in the shape and arrangement of the outer portion of the Grant tire, and that the advantages of the use of such shape were well known, prior to the application for the Grant patent, is shown in various patents of the prior art which I have pointed out in my direct examination.

By Mr. STALEY: All the first part of the answer down to the words, "I should say that the best instance," is objected to as not responsive and as immaterial.

X Q. 9. Near the close of your last answer in direct examination, you say you fully agree with the Circuit Court of Appeals of the Sixth Circuit, that "eliminating this alleged new feature" (meaning the possibility of the yielding of the retaining-wire to compensate for unusual strains), "the Grant structure presents no possible novelty." Do you also agree with this court in the statement found in its opinion, that "It may be conceded that no rubber-tired wheel

in the old art has been shown which includes each of the identical parts which unite to make Grant's tire"?

A. It is perfectly true that no single structure of the prior art presents all the details of construction of the Grant device. Thus, while the rim, the tire-base and the independent, endless retaining-wires are shown in combination, substantially as in the Grant patent, the external shape of the Grant tire does not appear in that combination, but is shown elsewhere.

X Q. 10. As I understand your testimony, you give it as your opinion that the function or operation which is said to result from the structure of the Grant tire to compensate for side strains, and which is accomplished by the tire turning on one wire while the other is permitted to move away from the channel will be accomplished equally well no matter what the exterior conformation may be, if the tire embodies that part of the structure termed the "unexposed portion;" is that right?

A. That is substantially my position. At least, it is my opinion that this feature or mode of operation would not be affected by any such difference in the outer or exposed portion of the tire as that between the Grant tire, on the one hand, and various other tires (like the Elliott tire, the Latta tire, etc.), on the other hand. Furthermore, the advantages due to the use of such a shape of the external portion of the tire as that shown in the Grant patent, are pointed out in the prior art, so that there could be no invention, in my opinion, in giving that external shape to any given tire.

By Mr. STALEY: The latter part of the answer, where the witness ventures to express his opinion on the subject of invention, is objected to as not responsive and as immaterial.

X Q. 11. In the Grant patent the widest part of the tire is placed within the channel, and the exposed sides extend inwardly at an angle so as to recede from this widest portion. Suppose now that the outer portion, instead of receding in this manner, should be continued on a line with the inner portion to a point above the channel, and then extended in parallel lines to the outer periphery. Is it not perfectly obvious that with such a construction, if there is a turning of the tire about one of the wires, or, as it has been called, a side rolling of the tire about this wire, it would be more or less interfered with by the contracting of the exposed side with the flange of the channel?

A. In my opinion, the fact that the outer portion of the tire had the shape suggested in the question would in no way affect the operation involving any lifting of the wire at that side of the tire receiving the lateral thrust. It is to be remembered that there is no description of any such operation in the Grant patent; but I refer to Mr. Livermore's deposition as explaining it. In his deposition in this suit, he said, in relation to it:

"By having the fastening wires independent of one another, one of them may yield to relieve the strain at that point, when, as is usually the case, there is a tendency of one side of the rubber to rise from the bottom of the channel while the other side remains

at the bottom of the channel. Thus, the fastening which is principally subjected to the strain may yield to distribute that strain, *while the other fastening remains unaffected* and tends to prevent the complete dislodgment of the tire from the rim."

Assuming that Mr. Livermore correctly stated the operation, I see no reason why such a shape of the external part of the tire as that suggested in the question would in any way influence or interfere with the operation.

X Q. 12. I assume, however, that if one side of the tire does rise, and with it the retaining-wire, to allow a lateral movement of the tire, the other retaining-wire being unaffected, the other side of the tire must roll or turn about the unaffected wire, which has a tendency to move the corner or widest part of the tire lower down in the channel, and that the shape of the channel and the shape of the exposed part of the tire also co-operates to permit this. Now my question is, if this is true, if the exposed part of the tire was formed differently, or with the widest part above the channel, as suggested in my last question, this operation would be more or less interfered with, and the lateral strain instead of being compensated for by a movement of the tire, would be sustained by the rubber itself, would it not?

A. I do not see how the shape of the exposed portion of the tire can affect this operation, in the way suggested in the question. When lateral pressure is applied to one side of the exposed portion of the tire, the tire becomes, in a sense, a lever which tends to lift up from the rim at the side on which the pressure is applied. It is not a rigid lever, however, but yields to the pressure, and is distorted in cross-section. In this distortion, the other portion of the tire is pushed over toward the flange of the rim at the side opposite that on which the pressure is applied to the tire. If the outer portion of the tire is of such shape that this distortion causes it to overlap the edge of the flange, the overlapping and pressure may tend to cause the abrasion of the side of the tire; but I cannot see that it will in any way hinder the lifting of that side of the tire to which pressure is applied.

X Q. 13. Following out that idea then, and assuming the rubber tire to be a lever, is it not perfectly obvious that if the rubber is extended on the side opposite the one receiving the strain until it overlaps the rim without any side pressure, the fulcrum point will be changed, and that instead of turning on the temporarily immovable wire, the fulcrum will be against the upper edge of the channel, and to this extent will interfere with the rising of the wire from the side to which the strain is applied, and such strain in this case would have a tendency to roll the tire out of the channel by contacting with the upper edge thereof, instead of rolling the tire in the channel, as is the case where the widest part of the tire is below the top of the channel, and with the exposed sides inclined inwardly?

A. I must say that these distinctions and their supposed effects seem to me to be without any substantial basis. There is no doubt that when lateral pressure is applied to one side of the exposed portion of the tire, there is a tendency to roll the tire out of the

channel. The element which materially resists this tendency is that retaining-wire on the side to which the pressure is applied. If this wire is sufficient to resist the strain, the tire cannot roll out of the channel; and the function of the other retaining-wire, at the opposite side of the tire, is simply to hold that part of the tire in its place, in order that it may be prepared, in its turn, to receive lateral thrust from the opposite side. I have no idea that the particular relation of the tire to the edge of the flange on the side opposite to that to which lateral pressure is applied can affect in any way the possible lifting of the retaining-wire at the side to which the lateral pressure is applied. It might be possible, of course, to so extend the flange on one side as to make it a solid barrier preventing lateral distortion of the tire in that direction; but I suppose that is clearly outside of any possible inquiry in this consideration.

It is to be remembered that the question whether the widest part of the Grant tire is or is not "within the periphery of the flanges" is not wholly dependent on the width of the flanges. Thus, for instance, the flanges shown in the drawing of the Grant patent may be narrowed until their edges are coincident with the angles of the tire, and this will have exactly the same effect so far as the departure from the description of the tire in the claim of the patent is concerned, as if the sides of the base portion were extended further upward or outward, so as to bring the angle coincident with the edges of the flanges, as shown. Suppose the flanges were made narrower in the way proposed. Would this change affect, in any way, or in any way interfere with the possible lifting of the retaining-wire at that side of the tire to which lateral pressure is applied? Evidently not, and, in my judgment, this whole operation of the retaining-wires is in no way dependent upon the question whether the angles or corners of the tire are or are not within the periphery of the flanges.

X Q. 14. I think you have gotten away from the question, whether purposely or not, and therefore not answered it. I will therefore put the question this way: Following out your idea of treating the tire as a lever, and assume now that the section of the tire which is to receive the strain is rigid or unyielding, and that the fastening devices, being the retaining-wires, were used, would there be no difference, in your opinion, in the operation or the movement of the tire in resisting lateral strain, whether the shape of the tire was that shown in Figure 2 of the Grant patent or one in which the exposed side was formed on a line with the unexposed side and extended above and overlapped the periphery of the flange of the channel; and I would be pleased if you would answer this, negatively or affirmatively, without further discussion.

A. It is evident at a glance that substituting a rigid lever for the flexible rubber tire materially changes the conditions; and this is true, whether the lever has the cross-section shown in the Grant patent, or the different cross-section suggested in the question. If the rigid lever has the cross-section shown in Figure 2 of the drawing of the Grant patent, its base rests on the bottom of the channel from one side to the other, and if one side of this lever is lifted

from the base, its fulcrum is not the wire at the opposite side, but is the corner or edge of the lever itself resting on the channel. As a consequence, one side of the lever (and the corresponding wire) can not be lifted without lifting the other wire, though in less degree; and that wire does not "remain unaffected," as Mr. Livermore says it does, in the operation of the tire when pushed sidewise. It is apparent, of course, that if this rigid lever is not only extended over the edge of the flange, but rests closely upon it, the edge of the flange will be the fulcrum on which it turns when the opposite side is lifted; and this change of position of the fulcrum will slightly vary the movement of the adjacent wire resulting from any considerable lifting of the opposite wire. In my opinion, the fact that the lever actually used (that is, the cross-section of the rubber tire) is not rigid, but elastic, makes this illustration inapplicable.

Adjourned to Friday, October 13, 1905, at 10 o'clock A. M.

FRIDAY, *October* 13, 1905.

Met pursuant to adjournment.
Present, as before.

Cross-examination of Mr. WILES continued:

X Q. 15. As a matter of fact, and speaking generally, the same considerations will apply to a flexible lever as to a rigid lever, except as the action might be modified by the flexibility, would they not?

A. I should say that a lever which is flexible, in the sense that a steel bar is flexible, would operate in the same general way as if it were absolutely rigid—the operation being modified somewhat, perhaps by the flexibility of the bar, as suggested in the question. The rubber of one of these tires may be properly termed flexible and elastic, and, in fact, is flexible and elastic to a very high degree; but one of its most notable characteristics is the readiness with which it may be distorted—the first visible effect of lateral pressure applied to it being to change its cross-section. The operation of the rubber tire, under lateral pressure, appears to me to be, therefore, very different from that of a lever of any other material which might be substituted for it and subjected to lateral pressure with the purpose of moving the retaining-wire.

X Q. 16. However, if the form of the structure were such that if was made to fulcrum on the outer periphery of the channel opposite to that at which the strain is applied, instead of on the wire within the channel, a greater strain would be brought on the material itself, whether flexible or otherwise, would it not?

A. I see no reason to suppose so. If a lever having the shape of the Grant tire in cross-section, is rigid, lateral pressure applied to one side of the lever tends to lift that side away from the channel. This tendency is resisted by the adjacent retaining-wire, and the opposite bottom angle of the lever is thereby pressed against the bottom of the channel—its point or line of contact with the bottom of the channel being the fulcrum. This corner or angle at the bottom of the tire is pressed downward; and its fulcrum must be something that resists the downward pressure, that is, the pressure toward

the bottom of the channel. It is evident that the wire adjacent to the corner so pressed downward is not the fulcrum, for the wire tends to draw that corner toward the bottom of the channel—the wire itself being under high tension, for that very purpose. The corner or angle of the rigid lever resting on the bottom of the channel being the fulcrum, any lifting of the opposite side of the lever, by reason of lateral pressure applied to it, must be resisted by the wire adjacent to the fulcrum-angle; and that wire must be lifted, though in less degree than the wire at the opposite side of the tire.

In the case of the application of lateral pressure to one side of the rubber tire, one immediate effect is the beginning of the distortion of the rubber of the tire. The upper or outer portion is pushed over laterally, and the rubber of the adjacent base-angle is drawn upward and away from the bottom of the channel—this action being apparent when only very slight pressure is applied to the side of the tire, and being entirely independent of any movement of the adjacent retaining-wire. As this portion of the rubber of the tire rises from the bottom of the channel and the upper or outer portion of the tire is pushed over laterally, this change of form presses the tire firmly against the flange opposite to that side of the tire to which pressure is applied, and I see no reason whatever to suppose that this pressure of the rubber against that flange has any tendency to raise the adjacent retaining-wire. It seems to me obvious, therefore, that lateral pressure applied to a rubber tire at one side has no such effect on the opposite retaining-wire as would be present if the rubber were replaced by some rigid material, and it is apparent that the same rule cannot be said to govern both operations.

If the fulcrum of the rigid lever is shifted from the bottom of the channel to the upper edge of the flange, the tendency of the change is to increase the distance which the adjacent wire would be lifted in any lifting of the opposite wire—though this difference would be extremely slight—the relations of the centers being such as to scarcely change the result. In the case of the rubber tire, I am satisfied that the change of normal shape causing the tire to overlap the flange before the application of pressure, would have no tendency to cause the adjacent wire to rise, and would offer no added resistance to the lifting of the retaining-wire at that side of the tire to which pressure is applied. I do not see that the proposed change will in any way increase the strain upon the rubber, of any lateral pressure applied to the side of the tire.

X Q. 17. Following out the same line of thought, and assuming the tire inflexible, if the fulcrum corner were directly under the adjacent wire, then there would be no upward movement of this adjacent wire upon the rising of the opposite side of the tire, would there?

A. There would not.

X Q. 18. And the farther this fulcrum is raised up to a point horizontally opposite the wire, the greater the vertical movement of the adjacent wire would be; this is also true, is it not?

A. The mere raising or lowering of the fulcrum has nothing to do with this problem. If a fulcrum is directly below the wire, or in

directly above it, the oscillation of the lever (unless through a very large angle) has no tendency to raise or lower the wire, since any movement of that part of the lever engaging the wire is substantially parallel to the bottom of the channel.

X Q. 19. But the rising of the fulcrum from a point immediately below to a point horizontally opposite the wire, assuming that the wire remains the same distance from the fulcrum, has everything to do with whether the wire will move vertically on the raising of the opposite side of the tire, has it not? I mean in the case of the inflexible or rigid structure which we have been assuming.

A. When the fulcrum is moved laterally outward from a vertical line passing through the wire, a corresponding tendency of the wire to lift, when the opposite end of the rigid lever is lifted, is obviously developed; and this is true, whether the fulcrum point is at the bottom of the channel, or at any point above the bottom. If, however, the fulcrum point is not only moved laterally, as suggested, but is moved upward, the tendency of the adjacent wire to lift when the opposite end of the rigid lever is raised, will increase until the fulcrum-point is at the horizontal level of the wire; but if the fulcrum-point is shifted still further upward, the tendency of the adjacent wire to lift will be decreased. The essential element as to the position of the fulcrum-point in this respect, is its lateral distance from the vertical line passing through the wire. I only speak of the element of lateral movement as "essential," for the reason that without it there is no tendency of the wire to lift, unless the rigid lever moves through a large angle.

X Q. 20. This being true, the structure if made in the shape of the Grant patent, though rigid, as before said, would tend always to press the fulcrum corner against the bottom of the channel, while if this fulcrum were moved up to the periphery of the channel, the movement of the opposite side of the structure would raise this corner away from the channel, would it not?

A. If the angle or corner of the lever is the fulcrum-point, the constant tendency, of course, is to press it against the bottom of the channel. If the fulcrum-point is shifted to the edge of the rim, the upward movement of the opposite side of the lever tends to raise the bottom corner slightly, and also to move it away from the flange.

X Q. 21. Still assuming the rigid structure, there would then be a change in the operation of the device, if the exposed parts were changed from the contour shown in the Grant patent to a form such as heretofore referred to, in which the exposed side extends over or overlaps the outer periphery of the channel flange, would there not?

A. Theoretically, there would be a slight difference in the distribution of the strain produced by lateral pressure on the rigid lever, since the change of location of the fulcrum of the rigid lever would tend to slightly increase the extent of the lift of the adjacent retaining-wire, due to any lift of the other wire—that is, the wire at the side to which the lateral pressure was applied.

X Q. 22. And theoretically, at least, there would be a corresponding difference in the operation if the structure were flexible, instead of rigid, would there not?

A. In my judgment, there would not. I have already pointed out the fact, which seems to me perfectly obvious, that when lateral pressure is applied to one side of the tire, the tendency to lift the adjacent retaining-wire is developed, but there is no tendency to lift the opposite retaining-wire. Considering the matter theoretically, and without having attempted to test it practically, I should say that when lateral pressure is applied to one side of the exposed portion of the tire, the application of this force tends to raise the adjacent bottom corner of the tire away from the bottom of the channel; and this strain constitutes an outward or lifting pull on the adjacent retaining-wire. At the beginning of the movement, the bottom of the tire is in contact with the bottom of the channel throughout its width; but the lateral push on the exposed part of the tire tends to raise that part of the tire adjacent to that side and at the same time to press more firmly against the bottom that part of the base of the tire farther away from the side to which the pressure is applied. I should say the fulcrum, at any given instant, would be the line of pressure and contact of the bottom of the tire on the bottom of the channel, nearest to that side to which the lateral pressure was applied; and I see no reason to believe that the tendency of lateral pressure applied to one side of the exposed part of the tire would have any tendency to lift the retaining-wire at the opposite side, whether the tire had the exact cross-section shown in Figure 2 of the Grant patent, or had such different cross-section of its exposed portion that either side face of the tire was in contact with the edge of the rim-flange.

X Q. 23. Assuming the elastic structure with the exposed side extending over the periphery of the channel rim, and lateral pressure applied to the opposite exposed side, the first effect of this pressure would be, as you have heretofore stated, to change the cross-section by pressing the rubber sidewise. This would press the overlapping portion strongly against the periphery of the flange, and, in a measure, exhaust the yielding capacity of the structure, so that further pressure would tend to operate it in the same way as in the case of the non-yielding structure, the fulcrum being on the edge of the flange and the tendency being to raise the entire tire-structure from the bottom of the channel, would it not?

A. In my opinion, that is not what would happen. When lateral pressure is applied to one side of the tire, it must tend to raise from the bot-om of the channel that part of the rubber between the adjacent retaining-wire and the adjacent flange of the rim; and it must correspondingly tend to press the rubber on the opposite side of said adjacent wire more firmly against the bottom of the channel. Owing to the flexibility of the rubber, that portion of the rubber can be forced with an added pressure against the bottom of the channel; and, in my judgment, that must be the immediate effect of the application of lateral pressure to the side of the tire, no matter whether the side of the tire is or is not in contact with the edge of the flange opposite the side to which pressure is applied.

X Q. 24. In a former answer you stated that the first visible effect of this lateral pressure on a flexible tire would be to change or distort

the cross-section; and in another answer you stated, "In this distortion the other portion of the tire is pushed over toward the flange of the rim at the side opposite that on which the pressure is applied to the tire." Now this being true, what is the effect of this first movement over against the flange when the exterior part of the tire is already overlapping the flange? Is it to increase or decrease the pressure against the periphery of the flange by this overlapping portion?

A. I said the first visible effect of the application of lateral pressure to one side of the tire was to push the outer portion of the tire laterally away from that side; and this statement is perfectly correct, although the lifting from the bottom of the flange of that bottom corner of the tire on the side to which pressure is applied is practically coincident with the sidewise movement of the outer portion of the tire—as may be seen by applying very slight lateral pressure to the tire of "Complainants' Exhibit Defendant's Rubber Tired Wheel" at any point adjacent to either of the places where the tire is cut for the purpose of showing the wires. It will be seen that, speaking in general terms, the effect of the lateral pressure tends to swing the entire body of the tire about the retaining-wire adjacent to the point where the pressure is applied. Suppose, for instance, that there was only a short section of tire at the point to which lateral pressure is applied; and that the rim and the opposite retaining-wire were cut away for a space equal to the length of the short section. It is apparent that under such conditions, the short tire-section would simply swing about the retaining-wire adjacent to the side where the power was applied. In this movement, the bottom angle of the tire-section lying outside of the retaining-wire would rise, or move away from the center of the wheel (that is, away from the plane of the bottom of the flange); the outer part of the tire would swing laterally in the direction of the application of power; and that part of the rubber of the tire on the opposite side of the retaining-wire to that on which power was applied would swing inward or downward toward the center of the wheel. Under actual conditions, when the tire is seated in the rim with both retaining-wires in place, the application of lateral pressure to the exposed part of one side of the tire has this same tendency. The bottom corner of the tire at the side on which power is applied, tends to lift out of the channel. The outer portion of the tire is pushed over laterally, in the direction of the application of power. That part of the tire on the opposite side of the retaining-wire from that to which pressure is applied, would move downward or inward toward the center of the wheel, if it were not restrained by the bottom of the channel; but since the bottom of the channel is present, it is simply pressed against it with added force. It appears to me that this is exactly what must happen, whether the tire has the cross-section shown in the Grant patent, or its outer portion has some other somewhat different cross-section, like that shown, for instance, in the Elliott patents or the Latta patent. In my judgment, there is, in either case, no tendency to lift the retaining-wire at the

opposite side of the tire from that to which the lateral pressure is applied.

It is apparent that the lateral movement of the outer portion of the tire must increase the pressure of the tire against the periphery of the flange toward which it moves; and I have no doubt that the pressure against the bottom of the channel is also increased.

By Mr. STALEY: All that part of the answer except the opening sentence and the concluding clause is objected to as not responsive to the question.

X Q. 25. As the lateral strain is increased on the tire, would this increase of pressure by the overlapping portion of the tire on the edge of the channel tend to increase or limit the pressure of the adjacent bottom portion or corner of the tire against the bottom of the flange?

A. It seems apparent that if the tire overlaps the edge of the flange on the side opposite to that where the power is applied, a portion of the added pressure which would otherwise be applied to the bottom of the channel, adjacent to that flange, will be applied to the flange; and the increase of pressure on the bottom of the channel adjacent to that flange would thus be limited.

X Q. 26. And to this extent at least, the operation of the tire in the channel by lateral pressure would be affected by the presence or absence of the overlapping part of the exposed side of the tire would it not?

A. I cannot see that the limitation of the increase of pressure on the bottom of the channel, at the side opposite that where lateral pressure is applied to the tire, can be fairly described as affecting the operation of the tire—it appearing to me to be immaterial whether the pressure of the tire on that part of the bottom of the channel increases somewhat more or somewhat less under a given lateral pressure. I can see that if the side of the tire is repeatedly pressed against and lapped over the edge of the flange, the abrasion or cutting of the side of the tire may result; but I do not see that it makes any difference as to the presence or absence of the mode of operation described by Mr. Livermore—namely, the lifting of the retaining-wire at that side of the tire to which lateral pressure is applied.

X Q. 27. I suppose you recognize, in speaking of elastic and rigid bodies, that these terms are only comparative, and that practically all bodies are more or less elastic and have their elastic limit do you not?

A. That is true, in a sense; but in the use of a bar of steel or iron having the cross-section of the tire shown in the Grant patent, and substituted for the rubber tire, the elasticity of the bar might be disregarded in considering the effect of lateral thrust applied to its side.

X Q. 28. And so also with the rubber, if sufficient pressure were applied, its elastic limit would be reached and its effect would more and more approach that of the less elastic, or what we might term non-yielding, body, would it not?

A. There is no doubt that when lateral pressure is applied to a block of rubber—say, to the tire shown in the Grant patent—the resistance to deflection increases as the deflection increases; and the pressure may undoubtedly be increased until the stretched or elongated side of the rubber ruptures, provided the base of the block is so securely anchored as to withstand the necessary strain. When the elongated side of the block ruptures, it may perhaps be said that the rubber has reached its elastic limit. Whether the tire, held in place merely by the two retaining-wires, could be made to approach its elastic limit before tearing loose from the rim, I cannot say with certainty, since I have no experimental knowledge in the matter; but I should suppose it would not.

X Q. 29. In speaking of rubber, I suppose we agree that we really refer to rubber compound, and that these rubber compounds may be made to vary in their yielding capacities from what we call elastic rubber to hard or non-yielding rubber, do we not?

A. I know that pure rubber is compounded with other substances which decrease its elasticity, and that the different compounds are used for different purposes in rubber manufacture. If any of the compounds, when vulcanized, are "unyielding," I am not familiar with them. In making this statement, I exclude what is known as "hard rubber," which is a very different article from the yielding rubber used for tires, however it may be compounded. I am not in any sense a practical expert as to the manufacture or characteristics of rubber, but my understanding is that the addition of sulphur to the gum, for the purpose of vulcanizing, is wholly aside from "compounding," the latter term being applied to the mixture with the rubber of earthy or other inert matter in suitable proportions to give it the desired characteristics.

Adjourned to Saturday, October 14, 1905, at 10 o'clock A. M.

SATURDAY, *October* 14, 1905.

Met pursuant to adjournment. Present as before.

Cross-examination of Mr. WILES continued:

X Q. 30. In the Latta patent, No. 341,811, the rubber tire, with the wires therein, is an integral structure molded together, is it not?

A. The specification of the Latta patent says on this point:

"The two ends of each wire are *preferably* secured before the rubber is moulded, so that each wire constitutes a complete ring, and the rubber tire is *preferably* moulded in an endless ring of the proper size to fit the wheel."

The specification gives no directions for joining the ends of the wires subsequent to the moulding of the rubber, if the tire is not moulded in an endless ring—that is, if it is made in a straight length which is to have its ends joined to make an endless ring. The language of the specification is evidently suggestive, however, of the possibility of moulding the rubber as a strip and subsequently joining the ends of the wire, since it speaks of the other method of construction as "preferably" followed.

X Q. 31. Claims 6 and 7 of the Latta patent, which seem to be the only ones which refer in any way to the tire, state specifically that the Latta tire embodies "a wavy or serpentine spring-wire moulded into the tire," do they not?

A. The claims of the patent are merely somewhat different statements or definitions of what Latta supposed to be novel in the tire-structure shown in his patent; and the claims of a patent are in no sense the measure of the disclosure of the patent. Thus, for instance, the disclosure of the Latta patent would be ample basis for such a claim as this: "An elastic tire having a wavy or serpentine spring-wire extending longitudinally through it and having its ends joined." The presence of such a claim would neither add to nor take from the disclosure of the Latta patent.

By Mr. STALEY: The answer is objected to as not responsive, volunteered, argumentative, and wholly incompetent, and the question is repeated.

A. I thought I answered the question fully; but it seems I did not make myself understood. The claims of the Latta patent do not say, specifically or otherwise, that "*the Latta tire* embodies 'a wavy or serpentine spring-wire moulded into the tire.'" As I said before, the claims are merely definitions of what Latta thereby points out as *the novelty* of the Latta tire; and they are in no sense inconsistent with the idea that the tire disclosed in the patent may differ from the statement of either of the claims. The only point of this answer or the last answer is, that the claims of the patent are not descriptive of the disclosure of the patent, so far as it relates to the tire-structure, but are Latta's definitions of the novelty of the disclosure. This is true as to every claim of every patent; though it may often happen that a claim is fully and exactly descriptive of the disclosure of the patent. When that is so, it is to be determined by examining the whole patent, and not by merely reading the claim; and the form of the claim is practically immaterial as a measure of the disclosure of the patent.

By Mr. STALEY: The latter part of the answer, beginning with "As I said before," is objected to for the same reasons as the last answer; and a motion is made to strike it out.

X Q. 32. For the convenience of the court and counsel I quote claims 6 and 7 of the Latta patent, as follows:

"6. An elastic tire having a wavy or serpentine spring-wire molded into the tire, substantially as set forth.

"7. The combination, with the rim having a recessed seat for the tire, of an elastic tire having a serpentine spring-wire molded into the tire, substantially as set forth."

And I will ask you if you find any other claims in the patent which refer to the tire-structure?

A. There are no other claims referring to the tire-structure, nor has there been any possible question about the language of claims 6 and 7.

X Q. 33. This Latta patent is for a velocipede, is it not, and is so entitled?

A. It is.

X Q. 34. And the various claims specify certain details of the velocipede that Latta is supposed to have invented, do they not?

A. Claims 6 and 7 (the only ones relating to the tire-structure) are general in form, in the sense that they make no reference whatever to any limitation of the use of the tire-structure, in one type of vehicle rather than in another.

X Q. 35. Well, what about the other claims?

A. At the suggestion of counsel, I have looked at the other claims; and, so far as I see, they do not mention any particular type of vehicle in which their respective combinations are intended or adapted to be employed. If they are limited to use in bicycles, it is not because of the forms of the claims then, but on account of mechanical reasons purely. If it should appear that the wheel-structure set forth in claim 1, for instance, was admirably adapted for use in wagons, it would be idle to say that the use of that wheel-structure in a wagon was not the employment of the invention defined in that claim.

X Q. 36. I call your attention to the clause of the specification immediately following the quotation which you made in a recent answer:

"The wavy or serpentine form of the wires prevents them from drawing in the tire if broken therein, so that if the wires should break at several different points they would not permit the tire to become detached from the wheel."

Does not this clearly indicate that this wire or core is to be molded or otherwise formed as an integral part of the tire so that it cannot slip through the rubber, but will exercise its holding capacity even though it is broken in several places?

A. That statement undoubtedly refers to a construction in which the slightly serpentine wire is molded in the rubber; and, in fact, that is the only construction described in the patent. The non-slipping characteristic of the wire referred to as an advantage in the quotation in the question, is evidently regarded by Latta as the effect of such molding of the wire in the rubber; and this non-slipping characteristic is clearly one of the advantages pointed out as resulting from the proposed construction.

X Q. 37. Another advantage of the serpentine form of wire is that the wire itself shall form a spring, or, as Latta expresses it, a "spring-wire," to permit the tire to be expanded so as to pass over the rim of the wheel in placing the tire on the wheel; is this not right?

A. It is apparent that Latta intended the retaining-wires (by reason of their serpentine form) to have some longitudinal elasticity, and he describes this elasticity as adapted to permit the wires to stretch sufficiently to permit the tire to be placed into the seat of the rim, and to contract after the tire has been inserted; and this is one of the advantages pointed out in the specification.

Cross-examination closed.

ROBERT H. WILES.

Circuit Court of the United States, Southern District of New York.

In Equity.

THE CONSOLIDATED RUBBER TIRE COMPANY, and THE RUBBER TIRE WHEEL COMPANY, Complainants,

vs.

FIRESTONE TIRE & RUBBER COMPANY, Defendant.

Testimony Taken in the Above-entitled Cause this 25th Day of November, 1905, at Chicago, Illinois, Before Frederick C. Goodwin, Notary Public, on Behalf of the Defendant.

Present: Mr. Charles C. Linthicum for defendant; Mr. Border Bowman for complainant.

HARVEY S. FIRESTONE was examined as a witness on behalf of the defendant in the suit brought by the complainants herein against the Firestone Tire and Rubber Company and the following deposition of said witness taken in said suit was read into the record in this case by the complainants herein under a stipulation that it might be given the same force and effect as if the witness had been sworn and examined and so testified in this case.

HARVEY S. FIRESTONE, a witness produced, sworn and examined on behalf of defendant, deposes and testifies as follows, in answer to questions by Mr. Linthicum:

Q. 1. You are the president of the Firestone Tire & Rubber Company, the defendant in this case?

A. Yes, sir.

Q. 2. When was the company organized?

A. In the fall of 1900.

Q. 3. What is the business of the Firestone Tire & Rubber Company?

A. The manufacture and sale of rubber tires for vehicles.

Q. 4. It has been stipulated in this case that "Complainant's Exhibit No. 3 Defendant's Rubber Tire Wheel" was sent to the defendant's place of business in New York accompanied with the request to have a rubber tire applied thereto, and that thereupon defendant applied to the said wheel what is known as its side wire rubber tire, and that said wheel was afterwards returned, to the defendant, with the statement that what was wanted was an internal wire rubber tire to match the other wheels of the set; that thereupon the defendant removed the side wire rubber tires and applied the tire which is now upon said exhibit, and that the defendant had, in the ordinary course of business, applied other rubber tires similar to the one upon that exhibit wheel during the period of several months prior to the filing of the bill of complaint in this case. Will you please state whether the side wire rubber tire referred to in that stipulation is a patented tire, and if so, the name of the patentee?

A. It is a patented tire, made under patent issued to James A. Swinehart.

Q. 5. Who owns the Swinehart patent?

A. The Firestone Tire & Rubber Company.

Q. 6. Please look at the Swinehart patent No. 624,992, of May 16, 1899, a copy of which I now show you, and state whether that is the Swinehart patent you refer to.

A. It is.

Defendant's counsel offers in evidence the copy of the patent referred to, and the same is marked "Defendant's Exhibit Defendant's Side-Wire Tire Patent."

Mr. BOWMAN: Complainants' counsel objects to the offer of the exhibit on the ground that it is immaterial.

Q. 7. How long has your company been engaged in making and applying these side-wire tires to vehicle wheels?

A. It was organized to manufacture tires under this patent.

Q. 7*a*. And has it manufactured such tires continuously since it began business?

A. It has.

Q. 8. Whether or not this has been your principal article of manufacture and leading style of tire?

A. It has.

Q. 9. To what class of vehicles have you principally applied rubber tires having internal wires, such as shown on the wheel exhibit?

A. Light vehicles carrying a tire three-quarter to an inch and an eighth.

Q. 10. On tires above an inch and an eighth, what kind of fastening do you chiefly apply?

A. Tires manufactured under the Swinehart patent having cross-wires with outside retaining wires.

Q. 11. Why do you use the outside retaining wires?

A. It is a stronger, more substantial fastening, and holds the rubber in place better without destroying it.

Q. 12. As I understand it, this Swinehart tire has short wires imbedded within the base of the tire transversely to its length, while the side wires are not imbedded within the base; is that the construction?

Mr. BOWMAN: Objected to as calling for secondary evidence.

A. It is.

Q. 13. Will you please produce a specimen of the defendant's side-wire tire showing the manner of applying the tire to the wheel?

A. I will.

Q. 14. Aside from the tire fastening shown on "Complainants' Exhibit Defendant's No. 3 Defendant's Wheel and Tire," and defendant's Swinehart or side-wire tire, state, if you know, whether there are at the present time, and whether there has been at all times, since you became familiar with the rubber tire industry, other modes of fastening rubber tires to vehicle

wheels (meaning solid tires) in use, and prevalent in the trade, in this country.

Mr. BOWMAN: The question is objected to as calling for secondary evidence; it is further objected to as immaterial.

A. There are other tires on the market having different methods of fastening from the side-wire tire, or two internal wire tires.

Q. 15. Does the Firestone Company make other styles of tires beside the side wire and the internal wire?

A. We make what is called in the trade a "cushion tire" having one internal wire fastening.

Q. 16. Can you produce a specimen of this "cushion tire"?

A. I can.

Q. 17. How long have you been connected with the rubber tire industry?

A. Since December, 1896.

Q. 18. Was the cushion tire on the market in 1896?

A. It was.

Q. 19. Has it continued on the market ever since?

A. It has.

Q. 20. Does the defendant apply rubber tires to automobiles and various types of motor cars?

A. We do.

Q. 20*a*. Whether or not these internal wire tires, such as are involved in this suit, are used in the larger tires, such for example, as those employed on motor cars and other heavy vehicles?

A. To the best of my knowledge, we have never applied a tire of this construction, and there are very few, if any, applied by other manufacturers.

Q. 21. What is the prevalent mode of securing these large tires to the wheel?

Mr. BOWMAN: The question is objected to as calling for an assumption from the witness.

A. Where solid tires are used on automobiles, such as commercial vehicles, I believe that fully 90 per cent. of the entire business are equipped with side-wire tires manufactured under the Swinehart patent.

Q. 22. Whether or not other manufacturers of solid tires for these heavy commercial vehicles, and including the Consolidated Rubber Tire Company, the complainant in this case, make different forms of fastenings for such solid rubber tires to such wheels than is disclosed in the wheel exhibit offered to show infringement in this case—that is, whether such other manufacturers use other means than internal wires for securing such heavy tires?

A. As stated before, to my knowledge, we have never applied a tire having the internal wire fastening, and there were very few, if any, applied. I would also say that the manufacturers have, I believe, all of them, a differently constructed tire for automobile tires, including the complainant.

Defendant's counsel offers in evidence page 295 and a part of page

296 of a publication entitled "The India Rubber World," dated July 20, 1895, the same consisting of an article illustrated with cuts, and entitled "Carriage Wheel Tires in England," by Joseph Thos. Wicks, Manchester, and the same is marked "Defendant's Exhibit Rubber World Article."

Mr. BOWMAN: Objected to as immaterial.

It is stipulated that unless objection is made before the close of the proofs, the publication shall be accepted as of the date appearing thereon, and proof of the issuance and circulation of the same in this country, as of that date, is waived.

Cross-examination by Mr. BOWMAN:

X Q. 23. When were you connected with the company known as the Firestone Victor?

Mr. LINTHICUM: The question is objected to as not proper cross-examination.

Mr. BOWMAN: Attention is called to Q. 17 and answer in the direct examination.

A. From the fall of 1896 to the spring of 1899.

X Q. 24. During how much of that time did the Firestone Victor Company handle the internal wire tire of the present form, such as the Kelly tire?

A. During the entire time.

X Q. 24*a*. Was the Kelly-Maus or the Imperial sold during this time, and was each of those of the internal wire Kelly type of tire?

Mr. LINTHICUM: The question is objected to as not cross-examination, and also because it is indefinite, in that the word "Kelly" does not identify any tire to the court, and the complainants' patent does not cover all internal wire tires.

Mr. BOWMAN: In view of the objection, the question is withdrawn, and the following question submitted:

X Q. 25. You have referred to your experience with rubber tires and your knowledge of the prevalent form of rubber tires. I hand you a piece of rubber, and ask you if that does not fairly represent the present prevalent form of internal wire tire, assuming, of course, that the rubber is to be placed in a channel with the tops of the channel extending upwardly to the corner or angle of the rubber? I refer also to the prevalent form of tire for vehicles other than what you have termed "commercial vehicles."

A. I would say that it did represent the prevalent form of internal wire tire.

X Q. 26. Is that not known as the Kelly tire or the Kelly-Springfield tire? I refer to the sample before you.

A. There is a tire manufactured and sold very largely of this style, known as the Kelly-Springfield tire.

X Q. 27. What concerns are now manufacturing and selling, in the City of Chicago, internal wire tires like the sample or section which I have handed you. Please name those that you have in mind.

Mr. LINTHICUM: The question is objected to as not proper cross-examination. It is not disputed that the internal wire tire is largely made and sold, but no testimony contradicting that fact has been adduced by the defendant, and no proof of that fact has been offered by the complainant; therefore the question is not proper cross-examination.

Mr. BOWMAN: Complainant's counsel calls attention to Q. 21 and answer, of this witness' direct testimony, and also to Q. 14 and answer, wherein the witness was asked as to whether at the present time, and at all times, there have been other modes of fastening rubber tires to vehicle wheels different from those shown in the "Complainants' Exhibit No. 3 Defendant's Wheel and Tire" and defendant's Swinehart side-wire tire. Counsel insists that if that testimony is at all material, the present line of cross-examination is proper and explanatory thereof.

Mr. LINTHICUM: The defendant's counsel states that the object of the present deposition — simply to show that the complainants' patent in suit does not disclose the only practicable method of securing rubber tires to vehicle wheels, but that, on the contrary, various other modes of fastening are, and have been for many years, employed, some of them extensively and some of them preferably to the complainants' patented tire, but no attempt has been made to show that complainants' tire has not been used, and the extent of such use is not at all material or pertinent to the present inquiry, nor is it proper cross-examination.

Mr. BOWMAN: Complainants' counsel says that he is glad to know the object of this direct examination, for up to this point he failed to appreciate the significance of it, but insists that in view of the testimony, and laying aside what the object is, the cross-examination is proper.

A. So far as I know, there is only one company manufacturing rubber tire in Chicago. The manufacturers who have branches or selling agencies in Chicago, I believe all sell an internal wire tire.

X Q. 28. In Q. 14 you were asked as to other modes of fastening rubber tires than the complainants' method of construction and your side-wire construction. Did you intend to include what is known as the Morgan & Wright band tire?

A. I did.

X Q. 29. Would you say that it is a fair statement of the facts to say that Morgan & Wright are at the present time manufacturing and pushing in the trade that form of construction? I refer to the trade in the City of Chicago.

A. I understand they are still manufacturing a band tire, but I don't believe they are pushing the sale of it in the City of Chicago.

X Q. 30. I hand you a sample which I have understood represented a form of band rubber tire which has been made and has been sold in Chicago, known as the "Calumet Band Tire." Would you say that that fairly represents that band tire?

A. Yes, I would say that it fairly represents a band tire that was sold by the Calumet Tire Rubber Company.

X Q. 31. Would you say that they are at the present time pushing that tire?

A. I understand they have entirely given up the manufacture of rubber goods.

Mr. BOWMAN: Complainants' counsel offers in evidence the sample referred to in X Q. 27, and asks that same be marked "Complainants' Exhibit Kelly Internal Wire Tire," and also the exhibit referred to in X Q. 30, and asks that same be marked "Complainants' Exhibit Calumet Band Tire."

X Q. 32. Is it not a fair statement to say that with commercial vehicles, including motor cars and automobiles, whether for commercial or pleasure purposes, the prevalent form of tire is the pneumatic tire?

A. I would say that it is a fair statement to say that practically all of automobiles used for pleasure cars or passenger traffic, are equipped with pneumatic tires, and that all automobiles and motor cars used for commercial purposes are equipped with solid rubber tires.

X Q. 33. Is it not a fair statement to say that the rubber tire you have heretofore referred to as a cushion tire, having one retaining-wire as a fastening device, is generally used, at the present time, for light service, such as runabouts or vehicles of similar character?

A. I would say that it is a fair statement to say that the cushion tire is used for light vehicles.

Re-direct examination by Mr. LINTHICUM:

R. D. Q. 34. Is it a fair statement to say that the Kelly-Springfield tire is generally used on light vehicles?

A. It is a fair statement to say that the Kelly-Springfield tire is generally used on light vehicles.

R. D. Q. 35. Since complainants' counsel insisted on your stating whether other manufacturers of solid rubber tires were selling the internal two-wire fastening here in Chicago, I wish you would state whether they are selling practically the same kind of two-wire tire as the specimen put in evidence as "Complainants' Exhibit Kelly Internal Wire Tire."

A. I would say that they are manufacturing and selling practically the same tire.

R. D. Q. 36. And it is not a fact that practically all the manufacturers of solid rubber tires in this country are making and selling tires with two internal wires and substantially like the "Complainants' Exhibit Kelly Internal Wire Tire" without license or other authority from the owners of the Grant patent in suit?

A. To the best of my knowledge, they are.

R. D. Q. 37. And they have been doing so ever since the decision of the Circuit Court of Appeals for the Sixth Circuit in what is known as the Goodyear case, with the possible exception of a brief period?

A. To the best of my knowledge, they have.

R. D. Q. 38. Referring to the Calumet band tire, as I understand

it, the retaining means for this form of tire is a continuous band having the same cross section as the apertures in the body of the tire,—that is, the band is continuous and composed of a strip of metal having rounded or bulbed edges which just fills the cavity in the rubber; is that correct?

A. That is correct.

Mr. LINTHICUM: Defendant's counsel offers in evidence a specimen of a side-wire tire produced by the witness, fitted to a channel, and the same is marked "Defendant's Exhibit Defendant's Side Wire Tire." Also a specimen produced by the witness, consisting of a channel section, a cylindrical rubber tire section, perforated longitudinally and having a single wire extending through the perforation, and the same is marked "Defendant's Exhibit Specimen Cushion Tire."

HARVEY S. FIRESTONE.

United States Circuit Court, Southern District of New York.

In Equity. No. 8992.

THE CONSOLIDATED RUBBER TIRE COMPANY and THE RUBBER TIRE WHEEL COMPANY, Complainants,

vs.

FIRESTONE TIRE AND RUBBER COMPANY, Defendant.

The Answer of Firestone Tire & Rubber Company, Defendant, to the Bill of Complaint of The Consolidated Rubber Tire Company and The Rubber Tire Wheel Company, Complainants.

This defendant, now and at all times hereafter saving and reserving unto itself all and all manner of benefit of exception that may be had or taken to the many errors, uncertainties and other imperfections in said bill of complaint contained, for answer thereto, or to so much and such parts thereof as this defendant is advised it is material or necessary for it to make answer unto, answering, says:

1. This defendant says that it has no knowledge, save from the bill of complaint, whether The Consolidated Rubber Tire Company, complainant, is a corporation organized and existing under the laws of the State of New Jersey, as alleged in the bill, and calls for proof thereof; and further, the defendant says that it has no information, save from the said bill of complaint, whether the complainant, The Rubber Tire Wheel Company, is a corporation organized and existing under the laws of the State of Ohio, as alleged in said bill, but defendant alleges that said The Rubber Tire Wheel Company is not now and has not been for years a valid or existing corporation, and calls for proof as to the allegation in that regard in the bill of complaint.

2. Defendant admits that it is a corporation organized and existing under the laws of the State of West Virginia, and states that its principal office, factory and place of business is at Akron, in the State of Ohio.

3. Defendant admits that letters patent of the United States No. 554,675 were issued to one Arthur W. Grant on the 18th day of February, 1896, for Rubber-Tired Wheel, but defendant denies that the said Arthur W. Grant was the true, original and first inventor of the devices and combinations of devices therein shown and described, and further denies that the same had not been patented or described in printed publications in this and foreign countries; that the same were not known and used by others before the alleged invention of the said Arthur W. Grant, and that the same have not been in public use and on sale in this country for more than two years prior to the date of the application for said letters patent No. 554,675.

4. Defendant, further answering, says that it has no information, save from the said bill of complaint, concerning the application for said letters patent or the regularity of the issuance thereof, and calls upon the complainants for proof.

5. Defendant, further answering, says that it has no knowledge, save from the said bill of complaint, as to the assignment by the said Arthur W. Grant to The Rubber Tire Wheel Company alleged in the bill of complaint to have been made on the 7th day of November, 1895, and recorded in the Patent Office on the 6th day of February, 1896, nor as to what title, if any, was acquired thereby, and calls for strict proof of complainants' title to maintain this suit.

6. Defendant, further answering, denies that the alleged invention and improvements of the said letters patent have hitherto been in the exclusive possession of the said patentee or his assignees, but on the contrary defendant alleges that neither said patentee nor his assignees have had at any time exclusive possession of said alleged improvements.

7. Defendant further denies that said alleged improvements have been largely introduced into public use by the complainants, but on the contrary defendant alleges the fact to be that the same were in general and public use prior to the granting of the said letters patent, and prior to any introduction of rubber-tired wheels upon the market by the complainants.

8. Defendant states that it does not know to what extent the complainants or either of them have granted licenses under the said letters patent, but defendant avers that the licenses granted by the complainants were the result of litigation begun and threatened by the complainants against manufacturers of rubber tires, and that in many instances said licenses were the result of trade agreements and that none of said licenses were granted or accepted in good faith or on account of any belief on the part of the licensees that the said letters patent were good and valid; defendant denies that the public has to any extent acquiesced in the validity of the said patent, and that the complainants would be in the undisturbed possession or enjoyment of any privileges secured by said letters patent, save for the acts of this defendant.

9. Defendant, further answering, says that it has no knowledge or information, save from the said bill of complaint, as to what interest, if any, the complainant The Consolidated Rubber Tire

Company has acquired by virtue of the acquirement of shares of stock of the complainant The Rubber Tire Wheel Company, but defendant denies that by reason of said stock jobbing transaction the complainant The Consolidated Rubber Tire Company acquired any right, title or interest in, to and under said letters patent, or any right to maintain this suit, and defendant therefore denies that the complainants have any joint right, title or interest in the said letters patent, or that either of them have any right or title to maintain this suit.

10. This defendant, further answering, admits that on or about the 28th day of August, 1903, The Rubber Tire Wheel Company granted to this defendant a license under the said letters patent No. 554,675, but defendant denies that the said license was granted in consideration of the payment of royalty or that the same was intended or accepted as a *bona fide* license or that it was intended thereby to acknowledge or acquiesce in the validity of the said letters patent. On the contrary, this defendant alleges the fact to be that it was distinctly understood and agreed, as a part of said transaction, that the defendant did not admit or recognize the validity of the said letters patent, and did not intend to and never did, in fact, pay any royalties thereunder, and that at the date of said license it was well recognized, known and understood by the parties thereto and by the general public that the said letters patent were absolutely invalid and void.

11. This defendant, further answering, denies that the complainants have marked rubber tires made and sold by them in alleged accordance with the said letters patent, "Patented," with the date of said letters patent, as required by law.

12. Defendant, further answering, denies that it is in any way or manner infringing upon any rights of the complainants in respect to the said letters patent No. 554,675, or that it is now so doing or intends or threatens so to do, or that any of its acts or doings have caused damage to the complainants or resulted in the acquirement of any profits to the defendant which should be accounted for and paid over to the complainants.

13. Defendant, further answering as to the litigation in relation to the said Grant patent, says that as to the suit of *The Rubber Tire Wheel Company v. Loubiere,* in the Court of Appeals of Paris, said suit was not and could not have been brought under said Grant patent No. 554,675, and that any judgment or decree in said suit is of no effect or force in the courts of this country; that as to the suits of *The Rubber Tire Wheel Company v. Columbia Pneumatic Wagon Wheel Company* in this court, the defendant is not fully advised as to whether the same was a contested suit, nor what effect, if any, may be given by this court to any such decision as may have been rendered therein; that as to the case of *The Rubber Tire Wheel Company v. Finley Rubber Tire Company,* in the United States Circuit Court for the District of Georgia, said suit was never tried upon its merits upon final hearing, and that the validity of said patent No. 554,675 was neither called in question nor determined in said suit or proceeding; that as to the suit of *The Rubber Tire Wheel*

Company et al. v. Goodyear Tire & Rubber Company, begun in the United States Circuit Court for the Northern District of Ohio,—it appears from the said bill of complaint that upon appeal to the United States Circuit Court of Appeals for the Sixth Circuit, said Grant patent No. 554,675 was declared invalid and void, and defendant says that as appears from the decision of this court, reported in 116 F. R., beginning on page 363, said court did not, as alleged in the bill of complaint, base its decision on premises untenable in fact, but that said decision is amply supported by the facts and is in all respects right. And the defendant says that said last mentioned decision was rendered subsequent to and with full knowledge of the other decisions referred to in the bill of complaint, and that by reason thereof the said Grant patent stands to-day as an invalid patent; that the complainants herein, seeking to question and overturn said decision and finding, petitioned the Supreme Court of the United States for a writ of *certiorari* to the Circuit Court of Appeals for the Sixth Circuit to require said court to send up the record and proceedings in said suit for the consideration and determination of that court, but that the Supreme Court denied said petition, thereby leaving the invalidity of the said Grant patent judicially established.

14. This defendant, further answering, says that the combination of devices attempted to be protected by said letters patent was in all essential respects a matter of common knowledge in this country long before the alleged invention or disclosure thereof by the said Arthur W. Grant; that the complainants nor either of them have ever manufactured, used or sold rubber tires or rubber-tired wheels containing the combination of devices set forth in said Grant patent, and that the combination intended to be covered by said claims is not a patentable combination or the result of invention, but was at most the result of mere mechanical skill.

15. This defendant, further answering, says that the patentee of said letters patent has admitted under oath that the mechanical combinations and arrangements disclosed by the said letters patent in suit were the result of mere mechanical changes developed by defects in the use of rubber tires, and that the remedy therefor was apparent to any ordinary mechanic watching the operation of such tires.

16. This defendant, further answering, avers that the alleged inventions, combinations and devices described and claimed in said letters patent in suit and identified by the bill of complaint herein, and long prior to the alleged invention or discovery thereof by said Grant, had been described, shown and patented in the following letters patent of the United States:

No. 11,446, August 1, 1854, George Souther.
No. 84,878, December 15, 1868, J. A. Green.
No. 86,504, February 2, 1869, John H. Cheever.
No. 86,709, February 9, 1869, C. S. Stearns.
No. 91,435, June 15, 1869, J. A. Green.
No. 169,100, October 26, 1875, J. A. Green.
No. 179,253, June 27, 1876, W. H. Bailey.
No. 192,005, June 19, 1877, C. P. Clark.

No. 193,988, August 7, 1877, Francis Mulliner.
No. 235,552, December 14, 1880, Thomas W. Moran.
No. 252,624, January 24, 1882, J. E. Richard.
No. 264,133, September 12, 1882, James O. Brown.
No. 294,461, March 4, 1884, P. Gendron.
No. 315,537, April 14, 1885, A. H. Overman.
No. 321,819, July 7, 1885, W. S. Kelly.
No. 339,422, April 6, 1886, James Hudson.
No. 339,550, April 6, 1886, James Hudson.
No. 341,811, May 11, 1886, Emmit G. Latta.
No. 345,351, July 13, 1886, L. E. Whiton.
No. 348,692, September 7, 1886, David H. Rice.
No. 353,071, November 23, 1886, H. A. King.
No. 357,819, February 15, 1887, C. E. Duryea.
No. 358,291, February 22, 1887, Edward C. F. Otto.
No. 362,472, May 3, 1887, Thos. Warwick.
No. 362,514, May 10, 1887, W. S. Kelly.
No. 364,989, June 14, 1887, Wm. H. Carmont.
No. 365,091, June 21, 1887, Frederick H. Owen.
No. 371,580, October 18, 1887, Frank H. Harris.
No. 383,129, May 22, 1888, Thos. B. Jeffrey.
No. 390,977, October 9, 1888, Camille Kramer.
No. 399,360, March 12, 1889, Amos W. Thomas.
No. 399,453, March 12, 1889, George T. Warwick.
No. 404,692, June 4, 1889, Rudolph W. Donmoyer.
No. 411,791, October 1, 1889, H. M. DuBois.
No. 412,699, October 8, 1889, H. M. DuBois.
No. 418,982, January 7, 1890, F. E. Lyon.
No. 419,005, January 7, 1890, H. M. DuBois.
No. 420,609, February 4, 1890, Southard & Klauser.
No. 420,610, February 4, 1890, Southard & Klauser.
No. 422,349, February 25, 1890, E. Francis Eldredge.
No. 424,084, March 25, 1890, Howard Unwin.
No. 424,452, April 1, 1890, P. J. Beiersmith.
No. 424,766, April 1, 1890, H. M. DuBois.
No. 431,223, July 1, 1890, Albert Claypool.
No. 431,512, July 1, 1890, H. M. DuBois.
No. 434,974, August 26, 1890, W. E. Bartlett.
No. 436,993, September 23, 1890, A. H. Overman.
No. 437,447, September 30, 1890, Overman Wheel Co.
No. 438,383, October 14, 1890, Overman Wheel Co.
No. 440,701, November 18, 1890, Sterling Elliott.
No. 440,702, November 18, 1890, Sterling Elliott.
No. 442,730, December 16, 1890, Elliott & Richards.
No. 443,735, December 30, 1890, Overman Wheel Co.
No. 448,793, March 21, 1891, W. E. Bartlett.
No. 449,502, March 31, 1891, A. Straus.
No. 20,678, Design Patent, April 14, 1891, C. Coops.
No. 450,816, April 21, 1891, A. H. Overman.
No. 452,001, May 12, 1891, Nicholas Yagn.
No. 453,520, June 2, 1891, A. Straus.

No. 456,751, July 28, 1891, George Ahlborn.
No. 459,363, September 8, 1891, L. A. Hill.
No. 460,243, September 29, 1891, Thomas Weir.
No. 463,153, November 17, 1891, E. G. Hoffman.
No. 464,767, December 8, 1891, C. E. W. Woodward.
No. 466,112, December 29, 1891, John H. Bingham.
No. 11,216, Reissue, December 29, 1891, W. E. Bartlett.
No. 466,548, January 5, 1892, C. E. W. Woodward.
No. 466,577, January 5, 1892, F. Schrader.
No. 467,112, January 12, 1892, F. S. Willoughby and Thomas Horsfield.
No. 467,769, January 26, 1892, Charles Challiner.
No. 468,971, February 16, 1892, Henry Myers.
No. 470,483, March 8, 1892, Grant & Jeffries.
No. 470,915, March 15, 1892, Wm. C. McIntire.
No. 473,831, April 26, 1892, John B. Dunlop.
No. 481,340, August 23, 1892, C. E. W. Woodward.
No. 482,487, September 13, 1892, L. J. Phelps.
No. 484,786, October 25, 1892, Fane & Lavender.
No. 488,494, December 20, 1892, Brown & Stillman.
No. 489,509, January 10, 1893, Frank Sweetland.
No. 493,650, March 21, 1893, E. F. Ryder.
No. 497,995, May 23, 1893, Frank W. Tucker.
No. 499,574, June 13, 1893, Chas. H. Pagett.
No. 501,992, July 25, 1893, David Crowther.
No. 506,424, October 10, 1893, Alfred Ducasble.
No. 511,850, January 2, 1894, W. Langmuir.
No. 527,820, October 23, 1894, John C. Tallman.
No. 529,474, November 20, 1894, Blosser & Kunkle.
No. 539,826, May 28, 1895, James G. Rodgers.
No. 540,478, June 4, 1895, P. Ambjorn Compte De Sparre.
No. 543,434, July 23, 1895, Theo. B. Blosser.

Letters Patent of Great Britain.

No. 4,352, September 11, 1883, Kearsley.
No. 4,926, March 15, 1884, Clark.
No. 9,359, August 5, 1885, Black & Jones.
No. 11,987, September 5, 1887, Beale.
No. 11,329, August 4, 1888, Beale.
No. 14,993, September 22, 1889, Brooke.
No. 16,336, November 10, 1888, Connolly.
No. 2,461, February 12, 1889, Wynne.
No. 1,901, February 12, 1890, Hoffman.
No. 3,014, February 25, 1890, Eldredge.
No. 3,705, March 8, 1890, James Hudson.
No. 4,064, March 15, 1890, Willoughby.
No. 6,521, April 29, 1890, Hookham.
No. 8,833, June 7, 1890, Phillipps.
No. 14,812, September 19, 1890, Lenton.
No. 14,563, September 16, 1890, Chas. K. Welch.
No. 15,448, September 30, 1890, Jno. Harrington.

No. 16,348, October 14, 1890, Bartlett.
No. 18,321, November 14, 1890, Whiteley.
No. 20,706, December 18, 1890, Timberlake.
No. 4,434, March 12, 1891, Benjamin Oldfield.
No. 12,580, July 24, 1891, Thomas Dale.
No. 12,205, September 8, 1891, Christian.
No. 4,977, March 14, 1892, R. W. Barker.
No. 5,924, March 26, 1892, F. S. Willoughby.
No. 9,006, May 12, 1892, D. Crowther.
No. 16,116, September 8, 1892, Walker.
No. 18,030, October 10, 1892, F. S. Willoughby.
No. 23,451, December 20, 1892, Henri Menier.
No. 21,341, November 9, 1893, A. Hutchinson & Co.
No. 24,962, December 28, 1893, Leo Ohnstein.

Letters Patent of Switzerland.

No. 8,120, February 17, 1894, Joseph Everett.

17. This defendant, further answering, avers that the alleged inventions, conbinations and devices described and shown in the letters patent set forth in the bill of complaint herein, had long prior to the date of the alleged invention or discovery thereof by said Grant been described and shown in certain printed publications as follows:

The printed publication known as or entitled "Elliott's Old Hickory Almanac," printed and published by Elliott Hickory Cycle Company at Newton, in the State of Massachusetts, in January, 1892, particular reference being had to the page between the calendars for September and October, 1892, therein.

The printed publication known as and entitled "India Rubber World and Electrical Trades Review," printed and published by The India Rubber Publishers Company, in the City of New York, in the State of New York, July 10, 1895, particular reference being had to the text and illustrations of an article entitled "Carriage Wheel Tires in England," on page 295, thereof.

18. This defendant, further answering, avers the fact to be that long before the date of the alleged invention of said Grant of the alleged improvements shown and described in the letters patent declared upon in the bill of complaint herein, and all material and substantial parts thereof alleged or claimed as new in said patent, were publicly known and used in this country for more than two years prior to the date of application of said Grant for said patent by the following-named parties at the following-named places:

Sterling Elliott at Newton, in the State of Massachusetts and elsewhere in the United States, who now resides at said Newton.

Charles E. Walker and George H. Day, each of said Newton, in the State of Massachusetts, and at the City of Hartford in the State of Connecticut, each of whom is now residing in said City of Hartford.

Elliott Hickory Cycle Company and Hickory Wheel Company each at said Newton, in the State of Massachusetts, each of whom is now located at the City of Hartford, in the State of Connecticut.

Hartford Rubber Works Company, at the City of Hartford, in the State of Connecticut, which is now located in said City of Hartford.

A. H. Overman at Chicopee Falls, in the State of Massachusetts, who now resides in the City of Springfield in the State of Massachusetts.

Theodore B. Blosser, at the City of Springfield, in the State of Ohio, who now resides at said City of Springfield.

Howard B. DuBois, at the City of Philadelpria, Pa., in the City of Philadelphia, Pa.

The Victor Rubber Tire Company, at said City of Springfield, in the State of Ohio, which is now located at said City of Springfield.

The Columbia Pneumatic Wagon Wheel Company at the City of New York, in the State of New York, which is now located in said City of New York.

The Rubber Tire Wheel Company at said City of Springfield, in the State of Ohio, which is now located at said City of Springfield.

E. S. Kelly, at said City of Springfield, in the State of Ohio, who now resides in said City of Springfield.

T. B. Jeffery, at the City of Chicago, in the State of Illinois, who now resides in said City of Chicago.

19. This defendant, further answering, avers that the said patentee, Arthur W. Grant, by the proceedings had and taken by him in the Patent Office, in connection with the obtainment of said letters patent and the modifications, admissions and disclaimers therein made by him, for the obtainment of said letters patent, has himself admitted that his alleged invention consists of nothing other or different than the precise mechanical detail of construction exhibited by his patent, and has made it certain as a matter of fact in view of the patents above cited and not present or before the Patent Office, that the combinations and devices do not disclose patentable novelty and invention and that the Patent Office would have so found had such letters patent herein set forth been present and considered by the Office antecedent to the granting of the patent, all of which matters and things appear by reference to the file wrapper and contents of the application for said letters patent in suit, or a duly certified copy thereof to be hereafter produced in support of this allegation.

20. This defendant, further answering, avers that the specifications and drawings constituting said letters patent herein sued upon, do not distinctly point out, identify and claim the asserted inventions therein sought to be protected so that a person skilled in the industry to which this patent relates could understand and construct the same; this defendant averring that said patent is craftily drawn for the purpose of deceiving the public and of permitting the complainant corporations herein to make wide, general and sweeping claims against competitors in business under said letters patent and embarrass the ordinary free course of trade in the industry to which this patent relates by so doing.

21. This defendant, further answering, denies that it has been notified in any legal or lawful manner whatever prior to the filing of the bill of complaint herein of the letters patent relied upon in

said bill of complaint or of the claims of the complainants as against this defendant thereunder.

All of which matters and defenses this defendant is ready and willing to aver, maintain and prove, as this Honorable Court shall direct, and if there be any matter, cause or thing alleged or charged in said bill of complaint which is not herein and hereby well and sufficiently answered or confessed and avoided, this defendant says that the same is not true, and prays to be hence dismissed with its reasonable costs and charges in this behalf most wrongfully sustained.

FIRESTONE TIRE & RUBBER CO.,
By H. S. FIRESTONE, *Prest.*
OFFIELD, TOWLE & LINTHICUM AND
PHILLIP B. ADAMS,
Solicitors and of Counsel for Defendant.

OFFIELD, TOWLE & LINTHICUM,
Of Counsel.

[Filed April 3, 1905.]

UNITED STATES OF AMERICA,
Southern District of New York, ss:

I, William Parkin, Clerk of the United States Circuit Court of Appeals for the Second Circuit, do hereby Certify that the foregoing pages, numbered from 1 to 1081 inclusive, contain a true and complete transcript of the record and proceedings had in said Court, in the case of Consolidated Rubber Tire Company, and another against Diamond Rubber Company of New York, as the same remain of record and on file in my office.

In Testimony Whereof, I have caused the seal of the said Court to be hereunto affixed, at the City of New York, in the Southern District of New York, in the Second Circuit, this 26th day of January in the year of our Lord One Thousand Nine Hundred and Nine and of the Independence of the said United States the One Hundred and Thirty-third.

[Seal United States Circuit Court of Appeals, Second Circuit.]

WM. PARKIN, *Clerk.*

UNITED STATES OF AMERICA, *ss:*

[Seal of the Supreme Court of the United States.]

The President of the United States of America to the Honorable the Judges of the United States Circuit Court of Appeals for the Second Circuit, Greeting:

Being informed that there is now pending before you a suit in which Diamond Rubber Company, of New York, is Appellant and Consolidated Rubber Tire Company & Rubber Tire Wheel Company are Appellees, which suit was removed into the said Circuit Court of Appeals by virtue of an appeal from the Circuit Court

of the United States for the Southern District of New York, and we, being willing for certain reasons that the said cause and the record and proceedings therein should be certified by the said Circuit Court of Appeals and removed into the Supreme Court of the United States, Do hereby command you that you send without delay to the said Supreme Court, as aforesaid, the record and proceedings in said cause, so that the said Supreme Court may act thereon as of right and according to law ought to be done.

Witness the Honorable Melville W. Fuller, Chief Justice of the United States, the 21st day of October, in the year of our Lord one thousand nine hundred and eight.

JAMES H. McKENNEY,
Clerk of the Supreme Court of the United States.

[Endorsed:] File No. 21,273. Supreme Court of the United States. No. 477, October Term, 1908. Diamond Rubber Co., of New York, vs. Consolidated Rubber Tire Co., et al. Writ of Certiorari. United States Circuit Court of Appeals, Second Circuit. Filed Nov. 20, 1908. William Parkin, Clerk.

Endorsed on cover: File No. 21,273. Supreme Court of the United States, October Term, 1909. Term No. 209. Diamond Rubber Company of New York, petitioner, vs. Consolidated Rubber Tire Company et al. Writ of Certiorari and return. Filed February 9th, 1909. 21,273.

[redacted]

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1908.

In the matter of the Application of the Diamond Rubber Company of New York for the Writ of Certiorari, under Section 6 of the Act of Congress, approved March 3, 1891, creating the Circuit Courts of Appeal.

DIAMOND RUBBER COMPANY OF NEW YORK,
Petitioner,
vs.
CONSOLIDATED RUBBER TIRE COMPANY AND RUBBER TIRE WHEEL COMPANY,
Respondents,

In the United States Circuit Court of Appeals for the Second Circuit.

To the Supreme Court of the United States of America:

The petition of the Diamond Rubber Company of New York for a writ of certiorari, directed to the United States Circuit Court of Appeals for the Second Judicial Circuit, and ordering that the records and exhibits in a certain cause be certified to this Honorable Court for final review and determination, under the provision of Section 6 of the Act of Congress of March 3, 1891, etc., said appeal cause being entitled as follows, in the Second Circuit: *Consolidated Rubber Tire Company and Rubber Tire Wheel Company, Complainants-Appellees,* v. *Diamond Rubber Company of New York, Defendant-Appellant.*

Statement of Case as to Parties, Subject-Matter, and Present and Antecedent Litigations.

Your petitioner, the Diamond Rubber Company of New York, respectfully shows and petitions this Honorable Court as follows:

First. That your petitioner is a corporation organized and doing business under the laws of the State of New York, and having its sole place of business in said city and state; that your petitioner is not a manufacturing corporation, but that its principal if not its sole business, is the handling and sale of rubber formations, sold in lengths, to be cut up and used as rubber tires for wheeled vehicles; that the manufacturing corporation from whom, alone, these lengths of rubber for tires, are purchased, is the Diamond Rubber Company of Akron, Ohio, and at Akron, Ohio, and an Ohio corporation, where, alone, they are manufactured;

Second. The respondent, the Consolidated Rubber Tire Company, is a New Jersey corporation, engaged principally, if not exclusively, in the manufacture and sale of rubber formations in lengths, to be cut up, or subdivided into lengths, for rubber tires for vehicles; the co-respondent, the Rubber Tire Wheel Company, is a paper corporation, organized under the laws of the State of Ohio, but without visible or asserted assets, except certain letters patent granted Arthur W. Grant for an alleged improvement in rubber tire wheels, under date of February 18, 1896, and numbered 554,675. The respondent, the Consolidated Rubber Tire Company, claims the right to appear as a party respondent in this cause, by reason of an assertion or claim, of holding license under said patent, from said Rubber Tire Wheel Company.

Subject Matter,—The Grant Patent.

The Grant patent in suit is found in full, both as to drawings, specification and claims, upon Certified Record, pages 134-5-6, and is here bound in and made part of this your petitioner's petition, for more convenient reference. The alleged invention is exceedingly simple in character and kind, and can readily be understood, by inspection of the drawings, and reading the first claim thereof. There are but two claims to this patent, and the second claim differs from the first claim, only by adding thereto a reinforcing strip of fibrous material upon the bottom of the tire, and wholly within the rim. The tire is the ordinary rubber tire, familiar to every one, and held in place in the channel rim either by the two internal wires, appearing in the patent, or by two external side wires. Such a complete analysis of this patent and its relation to the old art appears in the diverse opinions of the Federal Judges and Courts, who have passed upon it, hereafter to be presented, that we here enter into no extended discussion of the Grant patent, other than to say that in the various litigations concerning the validity and scope of this patent, that the tires, in such litigations, and the wheel rim, have always been of substantially the same construction, and the question of infringement in all cases has been practically the same.

Present and Antecedent Litigations.

The bill of complaint was filed in this case on June 2, 1907 The same day an order was entered by Judge Lacombe upon your petitioner to show cause, within three days, why the injunction should not be issued, according to the prayer of the bill. The injunction was granted and the case went to the United States Circuit Court of Appeals of the Second Circuit, where the patent had been sustained in the case of *Firestone Tire and Rubber Company* v. *Consolidated Rubber Tire Com-*

pany, 151 F. R., 237, and the Court of Appeals, upon the injunction motion, from affidavits alone, affirmed the injunctional order, under the stated practice of that court, with certain modifications and suggestions, reviewing the antecedent litigation upon this patent at that time, as shown in the following statement:

> "As we stated in the Firestone case, the patent was sustained in this circuit by Judge Thomas (*Rubber Tire Wheel Co.* v. *Pneumatic Wagon Wheel Co.*, 91 F. R. 978); in the Sixth Circuit (N. Dist. of Ohio) by Judge Wing, unreported; in the Fifth Circuit by Judge Newman (*Consolidated Rubber Tire Co.* v. *Finley R. T. Co.*, 116 F. R., 629). It was held invalid by the Court of Appeals, Sixth Circuit, in *Goodyear Tire & R. Co.* v. *Rubber T. W. Co.*, 116 F. R., 363, and in *Rubber Co.* v. *Victor Tire Co.*, 123 F. R. 85, and by Judge Anderson, in the Seventh Circuit, District of Indiana, unreported. A certiorari to review the decision of the C. C. A., Sixth Circuit, was denied, 187 U. S. 641. The patent was also indirectly involved in the decision of *Rubber Tire W. Co.* v. *Milwaukee R. Works*, 142 F. R. 531. It came before Judge Platt in this Circuit in the Firestone case, 147 F. R. 739, and was again sustained, and upon appeal from his decision, our opinion in that case, 151 F. R. 237, was rendered. The record at that time before this court, besides the testimony in the cause, contained as an exhibit the record which was before the C. C. A., Sixth Circuit, in the Goodyear case, and all the opinions above cited were also cited."

By the opinion of the Circuit Court of Appeals, upon the appeal affirming the injunction, and delivered by the ranking Justice, his Honor, Judge Lacombe, concluded the order of affirmance of such injunctional order as follows:

> "It would seem that the rights of all can be best preserved by affirming the order, at the same time directing the Circuit Court (upon the filing of a new bond or the extension of the old one) to suspend the operation of the injunction until final disposition of the cause. The record at final hearing will be so comprehensive as to present every question and when it reaches this court upon appeal,

a review of them can be secured from the Supreme Court either by certification or certiorari."

The decision, in its entirety, in this case in the Court of Appeals is found in 157 F. R., 677. This case then went back, and a record intended to be comprehensive was prepared at the Circuit; the patent was again sustained by his Honor Judge Holt, and a decree so ordered, and a hearing again had upon the transcript of record here present, in the United States Circuit Court of Appeals for the Second Circuit. The Grant patent, was there again sustained, his Honor Judge Coxe, writing the opinion of the court, and is present in this record upon pages 746 to 750, inclusive. A petition for rehearing was then filed by your petitioner, appearing upon pages 751-766, inclusive, this record, the petition for rehearing containing a prayer that the return of the mandate might be stayed for a reasonable time to enable your petitioners to apply for writ of certiorari to this Honorable Court to remove the cause thereto. Your petitioner's petition for rehearing was denied, but the decree ordered amended, as prayed for in the petition, and the mandate was stayed until August 1, 1908, with leave to apply for a further stay of the mandate "on proof that petition for a writ of certiorari had been duly filed."

It is under these circumstances and conditions that your petitioner is present in this Honorable Court with this petition.

Courts, and Decisions, Finding the Grand Patent Valid.

The condition and results of these various litigations, breifly epitomized, are as follows, upon full records made:

(1) The Grant patent was found valid, and infringed, in the year 1898 in the United States Circuit Court for the Eastern District of New York, in the case of one of these respondents, the Rubber Tire Wheel Co. *vs.* Columbian Pneumatic Wagon Wheel Co., 91 F. R., 978;

(2) The Grant patent was sustained by Wing, District Judge, in the United States Circuit Court for the Northern District of Ohio—decision unreported;

(3) The Grant patent was sustained by Newman, District Judge, in June, 1902, in the United States Circuit Court for the Northern District of Georgia in the case of these respondents *vs.* Finley Rubber Tire Company, 116 F. R., 629;

(4) The Grant patent was sustained in the United States Circuit Court for the Southern District of New York in the case of these respondents *vs.* Firestone Tire & Rubber Co., by Platt, District Judge, 147 F. R., 739, this decision in this case being known in the case at bar as the "Firestone case;"

(5) The Grant patent was again sustained, on appeal in this last case, "Firestone case," by the United States Circuit Court of Appeals for the Second Circuit, 151 F. R., 237;

(6) The Grant patent was sustained, upon an affidavit record, made upon a motion for an injunction (injunction granted), by District Judge Holt, in the United States Circuit Court for the Southern District of New York, June, 1907, as appears by the record in this case, being the same parties and the same litigation here present; and the United States Circuit Court of Appeals for the Second Circuit affirmed the injunctional order, as appears 157 F. R., 677;

(7) The Grant patent was again sustained at the Circuit by his Honor Judge Holt in this case, upon the record here certified—opinion unreported;

(8 and last.) The Grant patent was again sustained in this case by the United States Circuit Court of Appeals for the Second Circuit, as appears by the opinion filed in this case, Rec. p. 746-750.

An examination of these cases shows that there was something of doubt as to the weight and standing given to some of these litigations sustaining the Grant patent, and the decrees of the courts entered thereunder. Charges have been made that the decree entered in the first case by his Honor Judge

Thomas was entered after the parties litigant had settled all matters of litigation and differences between them, and the decree so entered therein could well be termed collusive. Judge Newman discusses this phase of the antecedent litigations, 116 F. R., 631. An examination of Judge Newman's decision shows also that in the case before him the defendant was estopped from denying the validity of the Grant patent, by reason of an existing license. (116 F. R., 629.) These antecedent litigations, epitomized, stand as follows:

Courts, and Decisions, Finding the Grant Patent Invalid.

(1) The Grant patent has been found invalid by the United States Circuit Court of Appeals, for the Sixth Circuit, in the case of the Goodyear Tire & Rubber Company *vs.* Rubber Tire Wheel Company, 116 F. R., 363. This was the same case decided by District Judge Wing in the United States Circuit Court for the Northern District of Ohio, *supra*, and went on appeal from that District to the Court of Appeals of the Sixth Circuit;

(2) The Grant patent has been declared invalid in the United States Circuit Court for the District of Indiana, by Judge Anderson—unreported—in the case of these respondents *vs.* Kokomo Rubber Company. This case was appealed by the complainants to the United States Circuit Court of Appeals for the Seventh Circuit, the record in full there printed, and the case ready for trial, but was dismissed upon the eve of the hearing of the case by the complainants, and the entire record in that case is here present as "Defendant's Exhibit, Appeal Record Kokomo Case;"

(3) The respondents in this case, and in all the cases, filed a petition in this Honorable Court for writ of certiorari in the case of these respondents *vs.* Goodyear Tire & Rubber Company, *supra*, from the U. S. Circuit Court of Appeals,

Sixth Circuit, and such petition for certiorari was denied by this Court, 187 U. S., 641;

(4) The Grant patent was again declared invalid by the United States Circuit Court of Appeals for the Sixth Circuit in the case of these respondents *vs.* Victor Rubber Tire Company, 123 F. R., 85;

(5) In the case of these respondents *vs.* Milwaukee Rubber Works, U. S. Circuit Court, Eastern District of Wisconsin, being a case brought to collect royalties under a license after this Grant patent had been declared invalid by the United States Circuit Court of Appeals for the Sixth Circuit, and this Court had denied the petition for writ of certiorari presented by these respondents in that case;—the court at the Circuit, Judge Sanborn, declined to enforce the provisions of the license contract, 142 F. R., 531. The Court of Appeals, however, for the Seventh Circuit, upon the record sent up in that case, reversed the finding and decree of the Circuit Court. A petition for writ of certiorari was then filed in this court by the defendants in that case, and was granted by this Honorable Court, largely, as we understand it, upon the ground that the Grant patent had been declared invalid in the Sixth and Seventh Circuits, and that a petition for writ of certiorari had been denied the complainants in that case,—but, as we understand it further, this petition was withdrawn by the defendant in that case after grant. The several decisions of the Courts of Appeal of the Second and Sixth Circuits are printed as an appendix to this petition for more convenient reference for this Honorable Court.

It will thus be seen that the Court of Appeals of the Sixth Circuit has twice declared this Grant patent invalid, upon full record made, and that the Court of Appeals of the Second Circuit has twice declared the Grant patent valid, upon full record made, and that there has been a division of opinion among the district judges at the circuits as to the validity of this Grant patent.

It would seem from these conditions that there is not only a difference of opinions, but there has been a direct difference of result in three federal circuits as to the validity of this Grant patent in suit, the patent now standing as a good and valid patent in the Second Circuit, and now standing as an invalid patent in the Sixth and Seventh Circuits, by judicial findings and decrees. It would seem that under these circumstances this petition for writ of certiorari should be granted, the record here present sent up, and the validity or invalidity of this Grant patent be determined for all of the nine circuits, and that this was the opinion of the Court of Appeals in this case upon the injunction motion, 157 F. R., 672, where that court said, as above, and again quoted:

> "The record at final hearing will be so comprehensive as to present every question and when it reaches this court upon appeal a review of them can be secured from the Supreme Court either by certification or certiorari,"—

there can be no doubt.

The diametrically opposite findings and conclusions between the Circuit Court of Appeals of the Second Circuit and the Circuit Court of Appeals of the Sixth Circuit, as shown by the respective opinions.

We have said that there is no possible doubt but that there is a difference in result in these various litigations in the Second, Sixth and Seventh Circuits, regarding the validity of this Grant patent in suit,—that is, this Grant patent has been declared invalid upon a full record, by the Court of Appeals in the Sixth Circuit, and at the Circuit in the District of Indiana, in the Seventh Circuit, and the Grant patent has been declared valid by the Court of Appeals of the Second Circuit. The direct issue between the two Circuit Courts of Appeals of the Second and Sixth Circuits can be brought in clear outline by quotations from the respective opinions in the two leading cases, where all questions were considered, viz., in the "Fire-

stone case," Circuit Court of Appeals, Second Circuit, 151 F. R., 237, and the "Goodyear case," Circuit Court of Appeals, Sixth Circuit, 116 F. R., 363.

"FIRESTONE CASE," CIRCUIT COURT OF APPEALS, SECOND CIRCUIT.

That court, in the "Firestone case," made the following statements relating to the Grant patent and tire—tipping capacity, and patentability:

> "The Grant tire has the capacity which no other possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber, or injury to any of the parts."

The court, further along in its opinion, says:

> "It now appears that the feature which secures patentability is inherent in the patent, and the specification is so clear and specific that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature is neither an accident nor an obscure property; it exists in every wheel on which is mounted a tire which follows the teachings of the patent. . . . The specification is addressed to those skilled in the art; it is enough that they understand it.
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> . . . . . .
>
> "That the capacity for readjusting itself when subjected to lateral strain is inherent in the Grant tire, seems perfectly plain and was demonstrated at the argument even by hand pressure applied to the tire at a point where the rubber had been cut down so as to expose the wires."

"GOODYEAR CASE," SIXTH CIRCUIT, COURT OF APPEALS.

The Circuit Court of Appeals of the Sixth Circuit, in the "Goodyear case," speaking upon this precise subject-matter, even as to detail, says, referring directly to the alleged tipping capacity of the Grant tire:

> "Oddly enough, the new mode of operation to which

the novelty of Grant's combination is attributed is not mentioned in the specifications, and its discovery is due to the keen optimism of professional experts.

. . . . . .

"That this capacity for side tipping or lateral movement under violent lateral strain, is an operative function inherent in the particular arrangement of the old parts constituting Grant's combination, is dependent wholly upon expert opinion. Its actual presence, from practical experience or observation, is not shown. Neither are the experts able to deduce this function from the instructions of the patent concerning the construction of the wires, for the patent is silent in respect, not only as to the function itself, but as to the proper tension of the wires in order to obtain it beneficially.

. . . . . .

"The specification gives no hint of this alleged joint action of all the parts to produce the tipping action, or of the advantage therefrom in preventing the tearing or cutting of the rubber from the wires. If this capacity for side movement be a benefincial function, plainly inherent in Grant's combination and arrangement of old parts in relation to each other and not a mere 'obscure property lurking in some accidental corner of the device,' it was not essential that the patentee should point it out as one of the advantages of his structure.

. . . . . .

"But this is not so in respect to the undescribed function of the Grant device, for he neither mentions any such capacity, nor describes any such arrangement of his retaining wires as will secure a capacity for 'rising or yielding' under lateral strain as a necessary result of the tension so provided for. The problem, so far as the public is concerned, is to remain a problem.

. . . . . .

"We learn now that this capacity for any beneficial yielding is dependent upon the wires being properly adjusted originally, and that this proper tension depends upon the right adjustment by the workman. If this tipping capacity had been pointed out and even this indefinite direction given by the patentee, as to the mode of securing the operation, the patent might possibly be saved, though this we need not consider. But neither the advantage of such a function nor any hint that it is in any

wise dependent upon the normal tension of the retaining wires is to be found in the patent.

. . . . . .

"Grant has not disclosed this alleged capacity of his structure for 'rising or yielding' on one side under severe lateral strain, nor has he disclosed any method of securing the same by the proper arrangement of the retaining wires to produce the proper tension upon which this capacity, in any beneficial sense depends."

Really, no substantial difference, between complainant's testimony in the "Goodyear Record," Sixth Circuit, and the testimony in the "Firestone Record," Second Circuit, as to the presence of this alleged "tipping capacity," in the Grant patent, and tire

In reading the opinion of the Court of Appeals in the "Firestone case" it would seem that that court had taken it for granted that in the "Goodyear case" there was no statement of fact as to the presence of the tipping capacity in the Grant patent and tire, but that such tipping capacity, as to any fact before the court, resided solely in the "keen optimism of the professional expert." This was an error upon the part of the court in the "Firestone case." Of course it would seem to be axiomatic that if this tipping capacity,—"the feature which secures patentability is inherent in the patent, and the specification is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action, which inheres in no other tire,"—that if this statement is true, as asserted by that court, in the Firestone case, it must have, of necessity, been equally true in the "Goodyear case." As that court further stated in its opinion in the "Firestone case" that the "capacity for readjusting itself, when subjected to severe lateral strain, is inherent in the Grant tire, seems perfectly plain and was demonstrated at the argument, even by hand pressure applied to the tire at a point where the rubber had been cut down so as to expose the

wires,"—if this "tipping capacity is inherent in the tire," and "perfectly plain," then, of course, this capacity was apparent in the "Goodyear case," and, as is perfectly plain, in the "Firestone case," and the two records are identical upon this point. An examination of the record in the "Goodyear case" shows also that the testimony in that case, as appears in the deposition of the patentee Grant, and of his expert Livermore, the same witness and expert quoted from in the opinion in the "Firestone case," that such witnesses testified clearly and unequivocally that the Grant tire had the capacity to tilt and reseat itself whenever receiving a severe side strain.

THE PATENTEE GRANT TESTIFIED IN THE GOODYEAR CASE UPON THIS POINT,—TIPPING CAPACITY.

Upon June 15, 1905, the patentee Grant in the "Goodyear case," as shown in the "Exhibit Goodyear Record," testified emphatically and clearly upon this point, as follows, the italics being ours:

> "*It would fill the channel so as to leave no space for the gathering of dirt or gravel, but still by employing this particular shape it would allow the tire to readily and easily reseat itself whenever receiving a severe side strain, which is the peculiar construction of the tire it was my intention to have it do, that is to say, have it so that it would ease or relieve itself whenever receiving severe side strain, and still immediately reseat itself.*" (Goodyear Rec., p.)

The patentee Grant, himself, in that deposition did not seem to be at all positive, in fact, directly otherwise, that his patent gave any intimation of this function or tipping capacity. Upon cross-examination as to this particular point, in the "Goodyear case," Grant testified as follows:

> "X-Q. 28. But your patent does not say anything about the rubber moving sidewise in the channel, or tipping sidewise so as to partially leave the channel and then reseat itself, does it, as you stated the tire does?
>
> "A. I think not.

"X-Q. 29. Do you know that your patent does not contain any such statement?

"A. *I do not know that it does. I have read it over several times and never saw any such statement.*"

The complainant's expert Livermore, testified in a dozen different places, in his deposition in the "Goodyear case," that the Grant tire has the capacity to rise and fall and reseat itself under lateral strain. The exact language appearing in one or two of the statements when speaking of this alleged function of the Grant tire and patent to tip and rise and fall and reseat itself, is as follows:

> "That is it consists in permitting the tire to rise slightly from the rim on one side, independent of the other, when subjected to very great strain, and immediately reseat itself when such strain is removed." (Exhibit Goodyear Rec., p. 274.)

Again, this expert Livermore says:

> "The specific form of rubber affords a broad firm support first at the bottom of the channel and sidewise with the flanges of the channel while permitting the rubber to rise in the channel at either side, when required." (Exhibit Goodyear Record, p. 275.)

Complainant's expert in the "Goodyear case" occupies over a printed page stating and giving his opinions as to the evident function of the Grant tire to rise and fall and reseat itself under severe use and lateral strain in travel. ("Exhibit Goodyear Record," pp. 278-9.)

We do not understand that in the "Firestone case" the testimony of the complainant in that case, upon this point, as to facts stated or proven, was anything other or different from that which appeared in the "Goodyear case." It is true that in the "Firestone case" there was set forth in the testimony of a witness by the name of "Krotz," in behalf of the complainant, a so-called test to determine the existence of the tipping and reseating capacity of the Grant tire under supposed side thrusts or strains. This so-called test was represented by a curious proceeding, or performance, with a mechanical

appliance connected with a certain kind of rubber tired wheel, in which, according to the admissions of the witness, Krotz, "there was no effort made whatever to tip the rubber" and the vehicle was "driven carefully."

The fallacy of the test in the "Firestone case" is discussed by your petitioner's expert witness, Pond, *in extensio*, as appears in this Record, pp. 211-219, and ample reasons given why such tests were a farce to determine any right fact as to the tipping capacity and result of the Grant tire under severe lateral strain. This test is not referred to nor relied upon in this case.

Truly, then, it would seem that the records in the "Goodyear case" and the "Firestone case" were in all respects substantially alike, and that the difference between the two cases was a difference, only, as to result; and opinions of the respective courts, given therefor.

It is true that in the opinion of the Court of Appeals in the "Firestone case" the learned judge writing the opinion stated that

> "In view of this new aspect of the case we have no reason to doubt that on the present record (Firestone case) the Court of Appeals of the Sixth Circuit would reach a result favorable to the patent."

As we have before stated there was no "new aspect" in the "Firestone case," so far as the record was concerned, except the testimony of the witness "Krotz," as to a certain test alleged to have been made by him upon a rubber tired wheel, to which we have reverted, and the statement of the "new aspect," referred to, may perhaps have been a species of pleasantry and polite statement now and then indulged in by the federal judges when they differ from their brother judges, directly, as to matters in question.

It will thus be seen by the decisions of both Courts of Appeals, Second and Sixth Circuits, the presence or absence of patentable novelty is determined by the presence or absence in the Grant patent, and in the Grant tire, of a "tipping ca-

pacity," or a capacity of the tire to readjust itself, and reseat itself when lifted from its base by severe lateral strain in travel. There are offered as exhibits in this case printed copies of the full records and paper exhibits, as physical exhibits, in the "Firestone case," the "Goodyear case," and the "Kokomo case." These records were all present as physical exhibits in the argument of this case both at the Circuit and in the Circuit Court of Appeals, and are here present for full reference and identification.

The record in this case establishes affirmatively as a matter of fact the entire absence of, and impossibility of, a "tipping capacity" in the so-called or alleged Grant tire, when wired on to the wheel rim with a high carbon steel wire to the utmost tensile capacity of such clamping wires, as now commonly done.

The record in this case is made up, and directed almost entirely to this single question of fact. Before briefly presenting,—or, more accurately stated,—identifying your petitioner's record as to this fact, your petitioner begs leave to impress upon this Honorable Court that your petitioner, the Diamond Rubber Company of New York, had nothing to do in any way, either directly or indirectly, with either record, or the case, in the three separate litigations represented by the "Goodyear case," the "Kokomo case," and the "Firestone case," and your petitioner takes it that the rights of your petitioner litigant will be determined by the record made in this case, and certainly that your petitioner is not bound, and should not be prejudiced by the record in the "Firestone case."

Your petitioner, averring further that the Court of Appeals in the "Firestone case," in the Second Circuit, could not rightly have understood and appreciated the actual facts, or the law of action of the so-called Grant tire when rightly clamped in position, or the decision in the "Firestone case" never

would have been written, and, while the result as against your petitioners may be the same as in the "Firestone case," the reasons for such result in the "Firestone case," applied to the case of your petitioner,—cannot be justified. The record in this case is different in several essential respects as to this question, or matter of fact of the "tipping capacity" of the tire of the Grant patent, than in the "Firestone case," and, as to elaboration and confirmation, than either the "Goodyear case" or the "Kokomo case." Your petitioner does not understand that in this petition for writ of certiorari it is necessary, or that it is desired by this Court that an extended argument be made by your petitioner, substantiated by extensive quotations from the record to establish at this time the absolute confirmation of the positions asserted, but only that the record shall be so identified as to exhibit to your Honors the fact that there is a difference of result between the decree and the findings of the Court of Appeals of the Second Circuit, and between the decree and finding of the Court of Appeals in the Sixth Circuit. The matters of fact proving conclusively that a "tipping capacity" cannot exist, and does not exist in the so-called Grant tire, when rightly applied, in any exigencies of travel, or lateral strain in travel put upon the tire, can be syllabused as follows:

(1) THE COURT OF APPEALS OF THE SECOND CIRCUIT MADE THIS STATEMENT OF FACT IN THE "FIRESTONE CASE":

> "The Grant tire has the capacity which no other possesses of readjusting itself and yielding to severe lateral strain *without tearing or abrasion of the rubber or injury to any of its parts.*" (The italics are ours.)

THE TESTIMONY IN THIS CASE SHOWS THAT WITH BUT FEW EXCEPTIONS AS TO INDIVIDUAL TIRES, THAT THE SO-CALLED GRANT TIRE IS DESTROYED BY TEARING AND ABRASION OF THE RUBBER, AND INJURY TO ITS PARTS BY THE CUTTING OF THE WIRES THROUGH THE RUBBER FROM THE CENTER TO THE

PERIPHERY OF THE TIRE, AND THE ENTIRE TIRE DESTROYED BEFORE THE PRACTICAL USEFULNESS OF THE TIRE ITSELF HAS BEEN AFFECTED;

(2) THE WHOLE BODY OF THE PRACTICAL TESTIMONY OF THIS CASE IS UNCONTRADICTED AS TO THE ACTUAL FACT, VIZ., THAT THE GRANT TIRE, WHEN WIRED ON TO THE FULL TENSILE STRENGTH OF THE HIGH CARBON WIRE, BY A MACHINE, DOES NOT, AND CANNOT, MOVE FROM ITS CONTACTING BASE, AS CLAMPED TO THE BOTTOM OF THE CHANNEL BY THESE RETAINING WIRES,—BUT IS PERMANENTLY CLAMPED AND AFFIXED TO SAID BASE, IN SO DOING;

(3) THE FACT IS PRESENT AND UNDISPUTED IN THIS CASE, AND HAS NEVER SO APPEARED, LITHER IN THE "GOODYEAR," THE "FIRESTONE," OR THE "KOKOMO CASES," THAT MAKES IT ABSOLUTELY CERTAIN THAT THE ALLEGED "TIPPING CAPACITY" AND RISING AND FALLING CAPACITY OF THE SO-CALLED GRANT TIRE, BY LATERAL STRAIN IN TRAVEL, IS A MYTH AND A FALLACY, WITHOUT ANY FOUNDATION AND FACT; THIS STATEMENT, SO CERTAINLY PROVEN BY THE FACTS PRESENT IN THIS RECORD, FROM THE LIPS OF A LONG ARRAY OF WITNESSES, VIZ., THAT THE SO-CALLED GRANT TIRES, WHEN DESTROYED BY CUTTING OR ABRASION OVER THE WIRES BEFORE BEING WORN OUT BY USE, ARE FOUND NATURALLY CEMENTED BY RUST AT THEIR BASE TO THE WHEEL RIM, THUS PROVING ABSOLUTELY AND CONCLUSIVELY THAT NO MOVEMENT OF THESE TIRES AT THEIR BASE HAD EVER TAKEN PLACE FROM THE DAY THEY WERE THERE CLAMPED IN POSITION UPON THE RIM BY STRETCHING THE HIGH CARBON STEEL WIRES TO THEIR UTMOST CAPACITY IN SO DOING;

(4) THE TESTIMONY OF THE PATENTEE GRANT, HIMSELF, IN THE FIRST CASE UPON HIS PATENT, IN 1898, SHOWS THAT GRANT KNEW NOTHING, AND HAD NO SUSPICION OF ANY DESIRED "TIPPING CAPACITY" IN HIS TIRE, AND WHEN THERE PRESENT BY FIRST FORMING THE TIRE, COMPLETE, AND JUMPING IT OVER INTO THE RIM, WAS A DEFECT TO BE ELIMINATED;

(5) AN ABSOLUTE DEMONSTRATION AND TEST WAS MADE, AND IS HERE PRESENT IN THIS RECORD, SHOWING THAT THERE IS NO MOVEMENT OR TIPPING OR RISING OR FALLING CAPACITY IN THE SO-CALLED GRANT TIRE, UNDER ANY STRAIN OF TRAVEL, VIZ., AN ALLEGED GRANT TIRE WAS LIGHTLY CEMENTED IN THE RIM OF A WHEEL, BEFORE CLAMPING IN POSITION BY THE TWO HIGH CARBON STEEL WIRES, AND THEN SUBJECTED, FOR A WEEK'S DURATION OF TIME, TO THE SEVEREST CONDITIONS OF TRAVEL AMONG CAR TRACKS, etc., IN THE CITY OF CHICAGO, AND WHEN REMOVED FROM THE RIM WAS FOUND TO BE STILL CEMENTED THERETO, AS WHEN PLACED IN POSITION.

All of these five facts and conditions are present in your petitioner's record in this case, for the first time, and without attempted contradiction or explanation upon the part of the respondent at any time in this action.

We shall not attempt to cite the testimony appearing at great length in this record in support of these five propositions, as to new subject-matter, and conclusive proof of the absence of any "tipping capacity" in the Grant tire, when rightly clamped in position by the two high carbon steel retaining wires, but your petitioner will content itself by reference to pages of the record where the different depositions of the different witnesses may be found, establishing the proof as to these questions of fact.

As to the first clause of statement above identified, where the Court of Appeals of the Second Circuit states that

> "The Grant tire has the capacity which no other possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber or injury to any of its parts,"

the following witnesses testified emphatically to facts that make plain the mistaken statement of the court in this regard, and that as a matter of fact the so-called Grant tire is destroyed by tearing and abrasion of the rubber and injury to

its parts long before the tire is worn out or materially affected in use upon its tread or surface:

Defendant's Proofs:

Mr. James W. Pitney, Record, pp. 538-539;
Mr. Samuel Lawson, Record, p. 547;
Mr. William H. Seaich, Record, pp. 554-555;
Mr. Edward Francis Delaney, Record, p. 561;
Mr. Frank P. Stone, Record, p. 571;
Mr. C. O. Harz, Record, pp. 584-585;
Mr. William S. Adams, Record, pp 591-592;
Mr. Charles F. Kimball, Record, p. 598;
Mr. Wallace D. Moon, Record, pp. 612-613;
Mr. Robert C. Irwin, Record, p. 618;
Mr. Louis Keuhne, Record, p. 334;
Mr. Charles F. Hudson, Record, p. 339;
Mr. Fred C. Koenig, Record, p. 348;
Mr. Charles H. Smith, Record, pp. 370-371;
Mr. Leroy Eighme, Record, pp. 401-402;
Mr. Harvey Edgerton, Record, p. 408;
Mr. Fred M. Meckel, Record, p. 416;
Mr. Albert Bubser, Record, p. 425;
Mr. Robert H. Wenz, Record, pp. 433-434;
Mr. Frank C. Gorman, Record, p. 442;
Mr. Homer C. Knight, Record, p. 456;
Mr. Fred Krumbick, Record, pp. 460-461;
Mr. Frank Glemblow, Record, p. 467;
Mr. Edgar W. Samuels, Record, p. 484;
Mr. Jacob E. Hanson, Record, p. 471;
Mr. Ernest R. Wickstrom, Record, p. 495;
Mr. Charles H. Knight, Record, pp. 508-509;
Mr. Albert Nolting, Record, p. 521.

As an example of this testimony, without repetition as to the whole body of the depositions of the witnesses, we call the attention of this Honorable Court to two depositions

only,—one a leading carriage builder in Chicago for nineteen years past, and the other a dealer and salesman of the so-called Grant tires for many years, and who had personally applied, and seen applied, many thousands of such tires.

Mr. Louis Keuhne testified that he employed on an average of fifteen or twenty men continuously, and had used the respondent's tire since 1894 or '95. Mr. Keuhne, when interrogated as to the wearing of the Grant tire for the last ten years, said (Record, p. 334, Q. 27):

> "A. In most cases the rubber was worn down to some extent, but in nearly every case they were cut through on the sides. That was the cause of our replacing them, because they were worn out and cut through on the sides."

Mr. Charles F. Hudson, familiar with these tires since 1896, testified as follows as to this point (Record, p. 339):

> "Q. 11. Have you ever seen or known of these solid rubber tires remaining in the channel without the rubber being cut out until the tire is worn practically down to the rim?
>
> "A. No, I never have."

As to the second clause of assertion, viz., that the alleged Grant tire when wired on to the full tensile strength of the high carbon retaining wires, does not, and cannot, move from its base, the following witnesses, having full knowledge of this Grant tire by long application and use, so testified:

Defendant's Proofs:

Mr. Thomas G. Broderick, Record, p. 289;
Mr. Francis A. Ludlam, Record, p. 304;
Mr. Omaire J. Duhamel, Record, p. 317;
Mr. Louis Keuhne, Record, p. 333;
Mr. Charles F. Hudson, Record, p. 340;
Mr. Fred C. Koenig, Record, pp. 348-349;
Mr. Charles H. Smith, Record, p. 367;
Mr. Leroy Eighme, Record, p. 403;

MR. HARVEY EDGERTON, Record, p. 409;
MR. FRED M. MECKEL, Record, p. 416;
MR. ALBERT BUBSER, Record, p. 425;
MR. ROBERT H. WENZ, Record, p. 434;
MR. FRANK C. GORMAN, Record, p. 443;
MR. HOMER C. KNIGHT, Record, p. 455;
MR. FRED KRUMBICK, Record, p. 460;
MR. FRANK GLEMBLOW, Record, p. 467;
MR. JACOB E. HANSEN, Record, p. 473;
MR. EDGAR E. SAMUELS, Record, p. 483;
MR. ERNEST WICKSTROM, Record, p. 494;
MR. CHARLES H. KNIGHT, Record, p. 505;
MR. ALBERT NOLTING, Record, p. 519.

As an example of the testimony of these witnesses we call the attention of the court to the depositions of Mr. Ernest Wickstrom, a carriage builder and manufacturer who had put on and taken off these so-called Grant tires for several years. Mr. Wickstrom testified that

> "If the wire is put in right the rubber in a severe test will tear before it will get it out of the channel, or tilt." (Record, p. 494, Q. 10.)

MR. ALBERT NOLTING, the master blacksmith for Parmlee & Company, the largest transportation company in the United States, and probably in the world, and who use exclusively the solid rubber tires, testified that the so-called Grant tire, when clamped in position by the utmost tensile strain of the wires possible, without breaking, never rose nor fell, or tilted or tipped in any way, by any strain that was put upon the exposed portion of the tire in travel. (Record, p. 519, Q. 29.)

As to the third clause of statement above identified, viz., that the so-called Grant tires, and in many cases with few exceptions otherwise, are found naturally cemented with rust with their canvas base to the tire rim when removed, thus

proving conclusively that such tires cannot rise and fall or tilt, this fact is proven, without contradiction by the following witnesses in this record:

Defendant's Proofs:

MR. FRANCIS A. LUDLAM, Record, p. 306;
MR. LOUIS KUEHNE, Record, p. 333;
MR. FRED C. KOENIG, Record, p. 349;
MR. CHARLES H. SMITH, Record, p. 371;
MR. LEROY EIGHME, Record, p. 402;
MR. HARVEY EDGERTON, Record, pp. 408-9;
MR. FRED M. MECKEL, Record, pp. 415-16;
MR. ALBERT BUBSER, Record, p. 427;
MR. ROBERT H. WENZ, Record, p. 434;
MR. FRANK C. GORMAN, Record, p. 442;
MR. HOMER C. KNIGHT, Record, p. 456;
MR. FRED KRUMBICK, Record, p. 461;
MR. FRANK GLEMBLOW, Record, pp. 467-8;
MR. JACOB E. HANSEN, Record, p. 475;
MR. EDGAR W. SAMUELS, Record, p. 484;
MR. ERNEST R. WICKSTROM, Record, p. 495;
MR. CHARLES H. KNIGHT, Record, p. 509;
MR. ALBERT NOLTING, Record, p. 521.

In this connection we refer your Honors to the depositions of two witnesses only, having full knowledge of the fact of the rusting of the canvas base of the tire in the so-called Grant tire to the rim, and the necessity of force to separate or tear such tire from the rim when removed,—as conclusive proof and negation of the assertion that there is any movement or tipping capacity of the tire in travel.

MR. EDGAR W. SAMUELS, who carries on an exclusive business in Chicago in the putting on and taking off of the solid rubber tires like the Grant patent in suit, and who during the

last four years has put on and taken some *ten thousand of such tires* by a mechanical appliance,

"Pulling them as tight as you can in order not to break."

(Record, p. 426, Qs. 4-10.)

testified that

"nine out of ten were stuck to the channel." (Record, p. 426, Q. 14.),

and that the tires had to be pulled out of the channel by hand, and that a portion of the canvas stuck to the channel. (Qs. 16-17.)

Mr. Charles H. Knight, who had applied some two or three thousand of these solid rubber tires, testified as follows as to this cemented condition of the tire (Record, p. 509):

"Q. 45. Do you mean that in 90% of these old tires so removed, there is an adhesion more or less by rust or corrosion between the canvas and rubber base of the tire to the rim channel?

"A. That is exactly what I mean."

As to the fourth clause of assertion, viz., that the patentee Grant himself in the year after the grant of the patent, in the first litigation, had no suspicion that there was any "tipping capacity" suggested or present in his tire or patent, except possibly as a defect,—there is in this record a deposition given by the patentee Grant some eleven years ago, or in April, 1897, and manifestly if Grant had had any knowledge or suspicion of any advantageous tipping capacity in his tire at that time he would have said so in that deposition, although he had said nothing about it in the specification of his patent, but, upon the contrary, at that time the patentee Grant testified (Record, p. 706, Q. 59) as follows:

"We used cement at one time, but not for the purpose of keeping them from traveling, but for the purpose of preserving the canvas on the lower side of the rubber and to assist in keeping the rubber tire from tipping over in the channel."

There can be no contention but that the cementing of the tire, as just described by Grant, to the base of the channel, negates any thought or suggestion of any "tipping capacity" of a tire so cemented. For this statement we have the high authority of the Court of Appeals in the "Firestone case," where the court, in throwing aside the tire of an antecedent patent as having no relation to the Grant patent, did so for the reason that the patent provided that the tire should be cemented in its place, the Court of Appeals in this connection saying, in its opinion, speaking of that patent:

> "The description says that 'it is obvious that the tire may be secured to its seat and cemented in the usual manner, if it is desired.' If this was done the distinguishing feature of the Grant tire would in any view be eliminated."

As to the fifth statement, or clause, to the effect that there is an absolute demonstration, and in no sense a test, present in this record, which shows the impossibility of any "tipping capacity" of the Grant tire when cemented to the rim, we cite as a conclusive demonstration of this fact the testimony of MR. CHARLES H. KNIGHT, who made certain this fact by the highest of all practical demonstrations to establish this certainty. Mr. Knight is president of the Chicago Rubber Company, and had been familiar with the so-called Grant tires for some ten years, and had put on and taken off some two or three thousand of such tires. Mr. Knight, to establish the certainty of the assertion that the so-called Grant tire, when wired in position by a machine for that purpose by the two high carbon steel wires strained to their utmost capacity, without breaking, never moved from their contacting base,—lightly cemented one of these alleged Grant tires upon the rim of a wheel, fixed by the clamping wires, as above stated, and then for a week's duration of time ran the vehicle so tired around over the streets of Chicago and car tracks, giving it the most severe test that could be given a rubber tired vehicle, and the rubber tire when so removed still remained lightly cemented,

—thus conclusivly showing that there had been no tipping action or capacity present in the vehicle. The detailed narrative of Mr. Knight's experiments and the result appears in this record upon pages 505 to 509.

The opinion of the Circuit Court of Appeals in this case manifestly based on the record in the "Firestone Case," and, seemingly, the record in this case ignored.

The learned judge writing the opinion in this case states that:

> "This case is in the nature of a re-argument of the question as decided in the Firestone case. It is not here upon newly discovered evidence, for the additional testimony was as available in that case as in this. There is more testimony it is true, but it is cumulative merely."

The learned judge adopted the language of the opinion of the trial judge below when speaking of the "Firestone case" in this case:

> "One side gave evidence that the wires would hold the tire firm and immovable, and the other side gave evidence that they would not. Now in this case you have called more experts giving the same kind of evidence, that the wires would not allow the tires to tip, but in my opinion that evidence is merely cumulative."

Judge Coxe then stated in this case that

> "The question of the capacity of the tires to rise slightly and readjust themselves when subjected to severe lateral strain, was one of the principal questions litigated in the Firestone case and, as we pointed out in our opinion, the tendency to do this was admitted by defendant's expert."

The court in this case then goes on to say that the defendant's expert in the Firestone case admitted this tipping capacity in the Grant tire and Grant patent, and then says that the court in the Firestone case

> "Were safe in assuming as established a proposition

about which the experts on both sides agreed, and the truth of which was demonstrated in open court."

It would thus seem that, as a matter of fact, in the "Firestone case" there was no contest as to the presence of the tipping capacity in the Grant tire, and the case was decided upon

"a proposition about which the experts on both sides agreed."

There is no dispute in this case but that the expert called by your petitioner, as well as a host of practical witnesses, denied the presence or any reference to a tipping capacity in the Grant patent, and denied any possibility of the presence of any tipping capacity of the tire itself under lateral strain in use when clamped in position by the two high carbon straining wires to their full tensile capacity, and gave manifold reasons for the opinion and statistics in that regard, and your petitioner respectfully submits that it is manifestly unfair to decide this case against your petitioner upon the record made and admissions made in the "Firestone case," and denied absolutely and unqualifiedly in this case.

Again, the Court of Appeals in this case states that the testimony taken in this case is "merely cumulative." Your petitioner challenges this statement as a matter of fact, and protests against its presence as an injustice against your petitioner and its record defenses here made. It is beyond the ken of your petitioner to understand why this testimony as to the absolute absence, as a matter of fact of the "tipping capacity" of the Grant tire (when rightly applied) by any lateral strain in use,—is "cumulative" testimony. What is it cumulative about? What to? It is not expert testimony in any sense, as none of the great array of witnesses called to establish the fact of the non-tipping capacity of the Grant tire are experts in any sense. They were men who for more than ten years had used and sold and applied and removed these so-called Grant tires in their own personal business, and as these tires are exceedingly expensive, they watched these tires

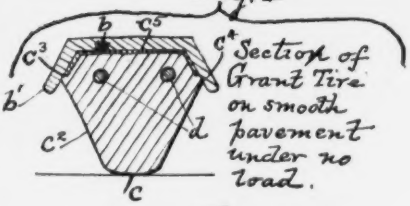
to prolong their lives, and had them under constant inspection. These men *knew* whether these tires rose and fell and rocked and lifted and tilted in actual use in travel, and the depositions and testimony of all of these witnesses are to questions of fact, and cannot in any sense be cumulative, especially as to a matter that was subjected only to expert theories and opinions in the "Firestone case," and in relation to which not one deposition of one witness relating to the *fact* was there present. As we have before remarked and identified, there is the testimony of a long array of witnesses in this case who had knowledge of the facts to the effect that the tire of the Grant patent, when locked and clamped in position by the two retaining wires stretched to the extent of their tensile capacity, the so-called Grant tire was held so firmly to its rim that the canvas and rubber base of the tire rusted or cemented to the rim to the extent of nine thousand out of every ten thousand tires so applied, in one instance in the City of Chicago, thus negating the fact of any tipping or rocking of the tire. Not a line of testimony was taken to deny this *fact*, yet the Court of Appeals cavalierly disposes of this undisputed mass of testimony by stating that it is not important, unless it be proved that the tires were subjected to severe lateral strain. It is in proof in this record that these tires so rusted and cemented were upon wheeled vehicles used in the City of Chicago, amongst its car tracks, in varying conditions, and that the streets of Chicago, and its car tracks, for many years past have been in the most wretched and trying condition possible upon which to run a rubber tired vehicle, this fact arising largely from the traction litigations pending in the courts, state and national, for many years.

The Court of Appeals in the case of your petitioner also found justification in ignoring the testimony in this case, as above identified, by a performance that was gone through within the court at the time of the trial, and referred to by the Court of Appeals in this case in the following language:

28

Defendant's Exhibit Pond Drawing No. 2.

Fig. 1

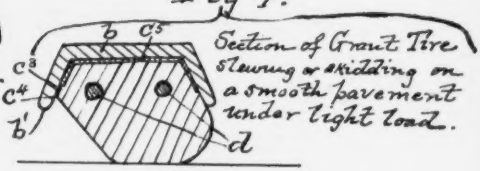


Section of Grant Tire on smooth pavement under no load.

Fig. 2.

Section of Grant Tire on smooth pavement under light load

Fig. 4.

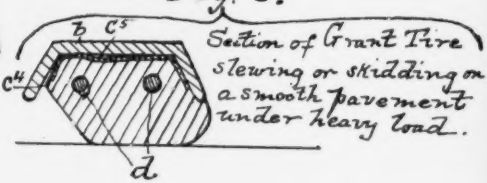


Section of Grant Tire slewing or skidding on a smooth pavement under light load.

Fig. 3.

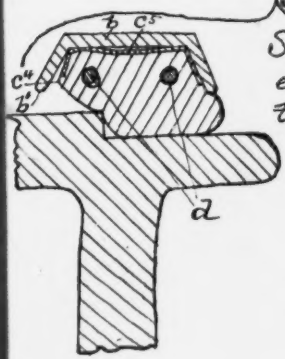
Section of Grant Tire on smooth pavement under heavy load.

Fig. 5.



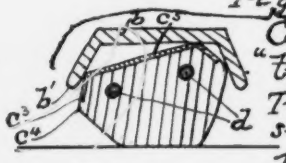
Section of Grant Tire slewing or skidding on a smooth pavement under heavy load.

Fig. 6



Section of Grant Tire encountering side-thrust of a rail of a street-car track under load.

Fig. 7.



Complainant's alleged "tipping" action of Grant Tire resulting from side-thrust under load.

> "We do not lose sight of the fact that the testimony shows that many of the tires from Chicago received rough usage, but this testimony avails little in face of the experiment which showed us the bottom of the tire held up by lateral strain and reseated the moment the strain was removed." (Record, p. 748.)

We protested in our petition for rehearing, filed in this case, against this so-called experiment, and its unfairness and failure in every particular to prove or demonstrate any right fact or condition in this argument. The test in open court consisted in clamping the exposed portion of a rubber tire on a wheel in a vise, and then bucking or forcing the wheel over to an angle exceeding 45 degrees, thus stretching the rubber over the clamping wires, as you would stretch a rubber band over a pencil, and so pulling out the rubber and stretching it that the canvas base of the tire would be exposed. No wheel or tire ever was or ever could be subjected to any such test in actual use, and no test is of any value, manifestly, except the use of a wheel in a condition that it would receive by lateral thrust or strain in travel. Of course if you could cut away the flange of the tire and get a cold chisel directly under the wire you could lift the tire slightly from the base, but this condition in actual travel equally, of course, never occurs. For the detailed discussion of the fallacy of this test to determine any right conclusions your petitioner respectfully refers to the petition for rehearing filed by your petitioner in this case. (Record, pp. 758-9.)

Your petitioner here presents a drawing appearing in this record as "Defendant's Exhibit Pond Drawing No. 2," that shows by free-hand sketches the action of the so-called Grant tire in use, as shown by the testimony of the witnesses in this case, and the position of the tire under different conditions brought about by the resiliency and flow of the rubber, and in Fig. 7 the alleged position of the Grant tire in use under lateral strain, as testified to by respondent's expert,—this drawing appearing in connection with Mr. Pond's deposition, on Record, p. 201.

Special Reasons why Your Petitioner's Petition Should be Granted.

First. The Grant patent is now declared valid by the Court of Appeals of the Second Circuit,—that circuit comprising the states of New York, Vermont and Connecticut, and extending from the Canadian border to the Atlantic Ocean. The circuit is a great empire in itself, and the federal districts comprising New York alone lies as a wide barrier between the New England States and the middle west, between the St. Lawrence on the north and the Atlantic Ocean on the south. No suits have been begun upon this Grant patent since its sustainment in the Second Circuit, in the "Firestone case," except in the federal courts of New York, and it is entirely fair to presume that no suits will be begun during the few years' lifetime of this patent, except in the federal courts of New York, or the Second Circuit. Admittedly, the State of New York, and the City of New York are the greatest centralized markets of the whole country. There is not a manufacturer of rubber tires in the United States, but has an exclusive or principal sales plant and market in the Second Circuit, and if your petitioner's petition is not granted, not only will the rubber tires, like the tires of the Grant patent and rim, be enjoined and driven out of the Second Circuit, but there can be no transport of these tires between New England and the West, or between Federal Circuits where the Grant patent has either been judicially declared invalid, or in which these respondents will never assert its validity in any federal court.

A denial of this petition will mean a multitude of suits in the Second Circuit against manufacturers of rubber tires of the so-called Grant type; against dealers of such tires, who buy and sell and apply such tires in the Second Circuit, and against an innumerable host of users of such tires,—carriage manufacturers, liverymen and private users in every city and

town throughout the Second Circuit,—without any opportunity of redress. The complainants will simply lie by in ambush in the Second Circuit and there alone levy tribute under the Grant patent, playing the part of the Robber Barons of the Rhine.

Second. Your petitioner's petition should be granted, because it appears by the record in this case, as above indicated, that your petitioner neither manufactures nor uses the alleged tires of the Grant patent; that your petitioner simply buys and sells such tires, and occasionally, upon request made, applies them to the rims of the wheels. It appears also that all of the tires that are handled and sold by your petitioner and all of the rims to which these tires are applied are manufactured or sold by an Ohio corporation, the Diamond Rubber Company, of Akron, Ohio, and that your petitioner purchases these tires and rims at Akron, Ohio, of said Ohio corporation, the Diamond Rubber Company, and from no other party, person or corporation. The contention made in this case, and the reasons advanced why your petitioner's petition should be granted, are that this Grant patent has been declared invalid by the United States Circuit Court of Appeals of the Sixth Circuit, and this, the Supreme Court of the United States, has refused to disturb such finding upon petition for writ of certiorari applied for by these respondents herein. 187 U. S., 641.

Under these circumstances your petitioner respectfully submits that the sale of the tires and rims by your petitioner alone proceeded against as an infringement in this action by these respondents, is unlawful, and that the tires and rims so handled and sold by your petitioner cannot be proceeded against, and your petitioner cannot be sued in the Second Circuit for an infringement of the Grant patent, based solely upon tires and rims purchased by your petitioner from the Ohio corporation, and in Ohio, and there alone manufactured or sold.

The justice of this contention of your petitioner is recog-

nized to a certain and material extent by the Court of Appeals in your petitioner's case, wherein the Court of Appeals has refused to enjoin your petitioner from the handling or sale of the devices represented by the Grant patent manufactured by certain manufacturers in the Sixth and Seventh Circuits, viz., "Victor Company," "Goodyear Company," and the "Kokomo Company," wherein these particular parties have the right to manufacture the tires of the Grant patent in the Sixth and Seventh Circuits and sell such tires in those circuits, and each of the other circuits, including the Second Circuit, as appears by the opinion in your petitioner's case. (Record, p. 746.)

The decision in the case of *Kessler* v. *Eldred,* 206 U. S., 285, is recognized to this extent by the Court of Appeals of the Second Circuit. This contention here made by your petitioner is recognized, as shown by the decision of the Court of Appeals, but not decided, the Court of Appeals stating as follows as to this matter, after directing the amendment to the decree to exempt the Goodyear, Kokomo and Victor tires:

> " We see no reason why this language could not be inserted in the decree and direct that it be amended accordingly. The amendment fully recognizes the applicability of the doctrine of *Eldred* v. *Kessler* (206 U. S., 285), to the case at bar. Whether it should be given a broader interpretation is a question upon which we express no opinion, deeming it more prudent to wait until the facts are fully developed.
>
> . . . . . .
>
> " The doctrine of Eldred and Kessler if carried to the extent contended for by the defendant will introduce radical and far reaching limitations upon the rights of patentees. These questions may not arise in the case at bar but if they should, the court would have the facts, and all the facts, before attempting to decide them."

Your petitioner's contention otherwise was that the tires and rims bought by your petitioner in the Sixth Circuit, from a manufacturer who manufactures such tires and rims in that circuit, can be handled and sold by your petitioner in the Sec-

ond Circuit, and elsewhere in the United States, from the fact that having been rightfully manufactured and rightfully sold in a circuit where the Grant patent has been declared invalid, they can thereafter be rightfully sold in any circuit, and even in the Second Circuit, where the Court of Appeals has declared the Grant patent valid. The question at issue in the "Goodyear case" was the validity of the Grant patent in the Sixth Circuit; the question of the individual defendant was an incident of this determination. Even if this is a suit to enjoin your petitioner from the handling and sale of the so-called Grant tires in the Second Circuit, your petitioner is so informed and believes they were rightfully purchased from a party in the Sixth Circuit, the Grant patent having been declared invalid in that circuit, your petitioner would have a right to sell these tires in the Second or any other circuit, because, the tires having been rightfully manufactured and purchased in one circuit, your petitioner could rightfully sell these tires in any other circuit.

Your petitioner being informed and believes that the law as laid down by this court and applicable thereto justifies this position of your petitioner, as appears by the case of *Chaffee* v. *Boston Belting Co.*, 22 How., 217-223, where the court says:

> "When the patented machine rightfully passes to the hands of the purchaser from the patentee, or from any other person authorized to convey it, the machine is no longer within the limits of the monopoly. . . . By a valid sale and purchase, the patented machine becomes the private and individual property of the purchaser, and is no longer protected by the laws of the United States, but by the laws of the States in which it is situated."

Morgan Envelope Co. v. *Paper Co.*, 152 U. S., 432.
Birdsell v. *Shaliol*, 112 U. S., 485.

Your petitioner respectfully submits that this question as to the applicability of *Kessler* v. *Eldred* to the conditions above identified, and undisputed as to your petitioner's purchase and sale of the devices proceeded against as an infringement, arises

FIG.15.

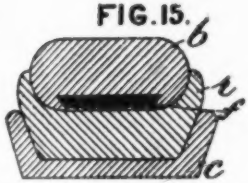


FIG.17.

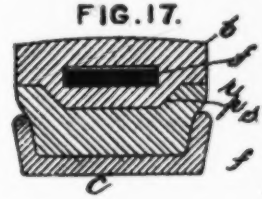


FIG.26

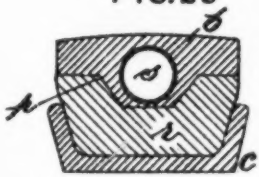


FIG.30.

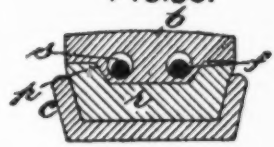


FIG.31.

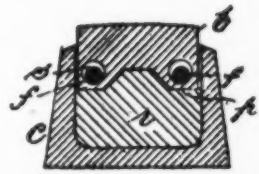


FIG.32

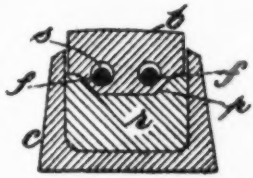


FIG.33.

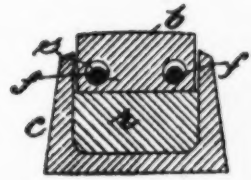


FIG.34.

WILLOUGHBY OCTOBER 10, 1892, ENGLISH PATENT.
Figs. 15, 17, 26, 30, 31, 32, 33 and 34.

Question of Infringement.

The Court of Appeals of the Second Circuit in the "Firestone case" found infringement in defendant's device of this Grant patent. The Court of Appeals of the Sixth Circuit and the Seventh Circuit did not pass upon the question of infringement, but simply found the Grant patent invalid. Lest there be any mistake upon this subject, as having any bearing or influence upon the grant of this petition, your petitioner respectfully submits that the devices proceeded against in this case were not an infringement of the Grant patent, as the Grant patent must be rightfully construed, and respectfully refer your Honors to the deposition of your petitioner's expert, Mr. Pond, in this connection, without repetition or discussion of particulars.

Conclusion.

In conclusion, your Honors, your petitioner respectfully submits that this, your petitioner's petition for the writ of certiorari should be granted, and the record in this case sent up for final review and determination by this court, as your petitioner is informed and believes is the rule and practice where there are direct diverging opinions between the respectice Courts of Appeals, and direct difference of results as to findings and decrees in said courts, as is represented by the leading cases in this court so determined.

Mast, Foos Co. v. *Stover Mfg. Co.*, 177 U. S., 485.
Columbus Watch Co. v. *Robbins*, 148 U. S., 267.

Whereupon your petitioner respectfully prays that this Honorable Court will be pleased to grant a writ of certiorari re-

quiring this said case in the Second Circuit to be certified to this Hoonrable Court for its review and determination.

DIAMOND RUBBER COMPANY OF NEW YORK.

BY HARVEY J. WOODARD,

Secretary.

NEW YORK CITY, N. Y., July —, 1908.

I hereby certify that I have examined and read the foregoing petition for writ of certiorari, and that in my opinion such petition is well founded, and should be granted by this Honorable Court, and that such petition is not filed for delay.

CHARLES K. OFFIELD,

Counsel for Petitioner.

APPENDIX.

Court of Appeals Decisions, Second Circuit, Finding Grant Patent Valid.

Consolidated Rubber Tire Co. et al vs. Firestone Tire & Rubber Co., 151 F. R., 237.

Consolidated Rubber Tire Co. et al vs. Diamond Rubber Company of New York (injunction motion), 157 F. R., 677.

Consolidated Rubber Tire Co. et al vs. Diamond Rubber Company of New York (final hearing), pp. 746-750 this Record.

Court of Appeals Decisions, Sixth Circuit, Finding Grant Patent Invalid.

Goodyear Tire & Rubber Company et al vs. Rubber Tire Wheel Company et al., 116 F. R., 363.

Rubber Tire Wheel Co. vs. Victor Rubber Tire Co., 123 F. R., 85.

CONSOLIDATED RUBBER TIRE CO. ET AL. *v.* FIRESTONE TIRE & RUBBER CO.

(Circuit Court of Appeals, Second Circuit. January 30, 1907.)
No. 223.

Before LACOMBE, TOWNSEND, and COXE, Circuit Judges.

COXE, Circuit Judge. The literature of the Grant patent, in so far as it relates to the situation before the commencement of the present action, will be found in the prior adjudications. The arguments for and against the patent will be found admirably stated by Judge Thomas in the Columbia Case and by Judge Lurton in the Goodyear Case, respectively. To this discussion little can be added on either side. We shall endeavor, therefore, to confine our attention mainly to the new facts and features which have been added to or developed from the records in the earlier cases.

Grant's claims cover combinations composed of elements which, when considered separately, were all old, but which were combined by him to form a structure, which, for the first time, placed in the hands of vehicle owners a perfect rubber tire. From the crudities, oddities, total failures and partial successes which had preceded him he constructed a tire which became popular almost from its inception. This was not the result of chance or the haphazard selection of parts; his success could only have been achieved by a careful study of the scientific and mechanical problems necessary to overcome the defects which rendered the then existing tires ineffective and useless. The problems demanded the exercise of faculties far above those possessed by the skilled mechanic. Few patents have received such immediate and well-nigh unanimous recognition. For years carriage manufacturers had been making strenuous efforts in this country and in Europe to secure a practical rubber tire. The moment Grant's structure appeared it was adopted by all the large manufac-

turers and to-day it is no exaggeration to say that no successful rubber tire can be made without embodying the distinguishing features of the Grant patent. Persistent efforts have been made to evade it, but without success. The tire described and claimed in the Grant patent is the standard rubber tire of to-day. This popularity may be accounted for in part by the financial ability of the owners of the patent to promote sales, but it was a most inconspicuous part. The hard-headed men of trade do not place themselves in a position where they must accept the alternative of an infringement suit or the payment of license fees for the use of an article, when an equally good article may be had for nothing. It should be and is the desire of the court in approaching the consideration of a patent for a structure which has thus won a position of unchallenged supremacy in the commercial world, to endeavor to sustain rather than defeat the claims. The combination of the patent operates, we think, to produce a new result or an old result in a manner which is a vast improvement over anything in the prior art. The Grant tire has the capacity, which no other possesses, of readjusting itself, after yielding to severe lateral strain, without tearing or abrasion of the rubber or injury to any of the parts.

The Circuit Court of Appeals found that the new mode of operation which produces this result is not mentioned in the specification or inherent in the combination but depends for its discovery upon the ingenuity of experts. Recognizing the rule that one who has invented a structure which cannot be used without including the function which produces the new result, is entitled to all the uses of his invention whether known to him or not, the court says:

> "If this tipping capacity had been pointed out and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved."

It now appears that the feature which secures patentability

is inherent in the patent, and the specification is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature is neither an accident nor "an obscure property"; it exists in every wheel on which is mounted a tire which follows the teaching of the patent. In view of this new aspect of the case we have no reason to doubt that on the present record the Court of Appeals of the Sixth Circuit would reach a result favorable to the patent.

The complainants' expert says:

> "It is absolutely impossible to adjust the tension of the wires, so that this yielding capacity will not be exhibited in the tire."

We are convinced, in view of the new testimony, that he is correct. The specification is addressed to those skilled in the art; it is enough that they understand it. Had the patentee attempted to point out the minute details of the elements making up his combination—such as the quality and degree of elasticity of the rubber, the material, size, strength and tensility of the wires and the exact amount of force needed to draw the wires together, he would have found himself surrounded by difficulties even more serious than those which now confront him. He chose to leave these details to the intelligent operator with the assurance that such a one would possess sufficient knowledge to draw the wires tight enough to hold the rubber firmly in the channel, but not tight enough to break them. Nothing more was required, for a tire so secured would necessarily have the capacity of reseating itself when subjected to unusual lateral strain and would infringe the claims. The entire prior art was before the skilled workman to the same extent as if written in the Grant patent, and, with this knowledge, it is hardly possible that he could set the tire so that it would fail to perform the functions referred to, unless he deliberately purposed to make a failure. On the one hand, he would know that he must not draw the wires tight

enough to break them, and, on the other, that he must draw them sufficiently to hold the tire snugly in the channel. Ordinary common sense would teach him to do this, and if he neglected to exercise it he would find that in one case the wires would break and in the other that the tire would rock, and, if subjected to any unusual jolt, would roll out of the channel. That the capacity for readjusting itself when subjected to lateral strain is inherent in the Grant tire seems perfectly plain, and was demonstrated at the argument even by hand pressure applied to the tire at a point where the rubber had been cut down so as to expose the wires. Indeed, the defendant's expert says:

> "There is no doubt that when lateral pressure is applied to one side of the exposed portion of the tire, there is a tendency to roll the tire out of the channel. The element which materially resists this tendency is that retaining-wire on the side to which the pressure is applied. If this wire is sufficient to resist the strain, the tire cannot roll out of the channel; and the function of the other retaining-wire, at the opposite side of the tire, is simply to hold that part of the tire in its place, in order that it may be prepared, in its turn, to receive lateral thrust from the opposite side."

Without discussing the subject further we are satisfied that the description of the patent is sufficiently full, clear, concise and exact to enable a person skilled in the art to make the Grant tire. We are also convinced that the new and useful tipping and reseating feature is inherent in the structure and that it was not necessary to point it out specifically, for the reason that no intelligent mechanic in the rubber tire art could follow the teachings of the patent without producing a tire possessing this function.

The patent to Latta, No. 341,811, granted May 11, 1886, is now advanced as the nearest approach to anticipation found in the old art. It is a somewhat significant fact that the Latta patent is not mentioned in the opinion of the court in either the Goodyear or Columbia case, but, irrespective of any presumption which may be drawn from its belated prominence,

we are of the opinion that its disclosures are in no way fatal to the claims in controversy. Our reasons may be epitomized as follows:

First.—The patent is for an improvement in velocipedes, or bicycles, where the wheels, guided by the rider, follow each other in a narrow track. The danger from lateral strain in such a vehicle is comparatively remote.

Second.—The description says that "It is obvious that the tire may be secured in its seat by cement, in the usual manner, if desired." If this were done the distinguishing feature of the Grant tire would, in any view, be eliminated.

Third.—The wires are molded into the tire, thus preventing all independent action between the wires and the rubber. If subjected to lateral strain the rubber will not turn on the wires, and if subjected to longitudinal strain it will not "creep" along them. The Latta tire in this particular is little more than a rubber tire reinforced and strengthened by wires.

Fourth.—The wires are wavy or serpentine in form, "which prevents them from drawing in the tire if broken therein." Every precaution seems to have been taken to prevent any independent movement of the wires. It is also obvious that with the use of these sinuous, wavy wires there must be many points where the wires are not within the inner or unexposed portion of the tire, namely, below the line between the two angles of the tire, as pointed out by Grant. When subjected to lateral strain at these points it would seem that the tire can no longer exert the necessary leverage to lift the side of the tire from the channel. In other words, the strain will operate to crowd the tire against the opposite flange with no tipping action to relieve the pressure.

Fifth.—Latta's tire is circular in cross-section, there being no angles as shown at c^4 of the Grant drawings. The widest part of the Latta tire is above the outer peripheries of the flanges and receives no protection therefrom.

Sixth.—The bottom of Latta's tire is concaved to fit a cor-

responding convexity in the bottom of the channel, and it is argued with some plausibility that such construction would in case of lateral strain, severe enough to cause either side to rise, result in jamming the rubber so that it could not readily reseat itself.

Other reasons might be given, but we think enough has been said to show that in our judgment Latta had no conception of the improvements found in the Grant structure.

Upon the question of infringement we deem it unnecessary to add anything to the opinion of the Circuit Court. The complainants hold the legal and equitable title to the patent, no outstanding interest in any other party is suggested, and we fail to see how such an interest can exist.

The decree is affirmed.

UNITED STATES CIRCUIT COURT OF APPEALS, SECOND CIRCUIT.

Before LACOMBE, WARD and NOYES, Circuit Judges.

Consolidated Rubber Tire Company and another
vs.
Diamond Rubber Company of New York.

This cause comes here upon appeal from an order for preliminary injunction entered in the Circuit Court, Southern District of New York. The operation of the injunction was, by a subsequent order, suspended until after the hearing and determination of this appeal upon defendant giving a bond in the amount of $10,000.

LACOMBE, Circuit Judge.

Complainants are manufacturers of rubber tires, and respectively owner of and licensee under the Grant patent of February 18, 1896, No. 554,675, for improvements in Rubber Tired Wheels. Defendant is not a manufacturer, but handles and sells rubber tires for wheeled vehicles. The patent was

before this court in *Firestone Tire Co.* v. *Consolidated Rubber Tire Co.*, 151 F. R., 237. It was held that the patent was valid and that certain tires then before it were infringements. On the application for preliminary injunction in the case at bar it appeared that defendant had sold tires in all substantial respects the same as those held to be infringements in the Firestone case. The record does not illuminate the prior art by the disclosure of any important prior patents or prior uses which were not contained in the record in the Firestone case. Upon such a state of facts the propriety of issuing preliminary injunction is well settled in this circuit, and it is equally well settled that appeal from such preliminary injunction brings up only the propriety of the action of the Circuit Court:—the whole cause is not to be reopened; that is a matter for consideration when the new cause comes to final hearing. *Am. Paper P. & B. Co.* v. *Nat. Folding B. & P. Co.* 51 F. R., 229; *Consolidated Fastener Co.* v. *Littauer*, 84 F. R., 165.

The only real question now presented is whether the peculiar history of this patent requires a denial of preliminary injunction in view of the recent decision of the Supreme Court in *Eldred* v. *Kessler*, 206 U. S., 285.

As we stated in the Firestone case, the patent was sustained in this Circuit by Judge Thomas (*Rubber Tire Wheel Co.* v. *Pneumatic Wagon Wheel Co.*, 91 F. R., 978); in the Sixth Circuit (N. Dist. of Ohio) by Judge Wing, unreported; in the Fifth Circuit by Judge Newman (*Consolidated Rubber Tire Co.* v. *Finley R. T. Co.*, 116 F. R., 629). It was held invalid by the Court of Appeals, Sixth Circuit in *Goodyear Tire & R. Co.* v. *Rubber T. W. Co.*, 116 F. R., 363, and in *Rubber Co.* v. *Victor Tire Co.*, 123 F. R., 85, and by Judge Anderson in the Seventh Circuit, District of Indiana, unreported. A certiorari to review the decision of the C. C. A., Sixth Circuit, was denied, 187 U. S., 641. The patent was also indirectly involved in the decision of *Rubber Tire W. Co.* v. *Milwaukee R. Works*, 142 F. R., 531. It came before Judge Platt in this

Circuit in the Firestone case, 147 F. R., 739, and was again sustained, and upon the appeal from his decision our opinion in that case, 151 F. R., 237, was rendered. The record at that time before this court, besides the testimony in the cause, contained as an exhibit the record which was before the C. C. A., Sixth Circuit, in the Goodyear case, and all the opinions above cited were also cited. Commenting upon the entire record then presented this court said:

> "In view of this new aspect of the case, we have no reason to doubt that on the present record the Court of Appeals of the Sixth Circuit would reach a conclusion favorable to the patent."

In *Kessler* v. *Eldred,* Eldred, the owner of a patent, sued Kessler, a manufacturer of electric cigar lighters, in the District of Indiana. The court found non-infringement and dismissed the bill. Subsequently Eldred sued Kirkland, another manufacturer of similar lighters, in the Western District of New York, was defeated at Circuit, but prevailed in the Circuit Court of Appeals. Eldred next sued Breitweiser, a user of Kessler lighters in the same district. While this last suit was pending, Kessler filed a bill in the Northern District of Illinois against Eldred to enjoin him from prosecuting any suit against any one for alleged infringement of the patent by purchase, use or sale of any cigar lighter manufactured by Kessler and identical with the lighter in evidence before the court in the first suit. The Supreme Court held that the original judgment conclusively settled the right of Kessler to manufacture and sell his manufactures free from all interference from Eldred by virtue of the patent there adjudicated and granted the relief prayed for.

Inasmuch as defendant here is a dealer and as such may wish to sell tires manufactured by the Goodyear Company which has secured adjudications adverse to the patent in the C. C. A., Sixth Circuit (*supra*), the judge who heard the motion at Circuit, in view of the decision in *Kessler* v. *Eldred,* inserted the following clause in the order:

> "Nothing in this injunctional order shall prevent, or is intended to prevent, or enjoin the defendant from handling, using or selling rubber tires and rims covered by the Grant patent, . . . manufactured by the Goodyear Tire and Rubber Company having a right to manufacture, use and sell such tires under a judicial decree in a litigation in the Federal Courts in the District of Indiana heretofore pending between this complainant and such parties, wherein it has been judicially determined that said Grant patent is invalid and void."

The complainants cannot now question the propriety of inserting this clause, because they have no appeal from an order refusing to issue injunction, and the clause is a refusal to enjoin tires made by the Goodyear Company. Defendant contends, however, that the reservation does not go far enough; that defendant should be left free to sell any infringing tires made in the Sixth Circuit, or in any circuit other than the second, or that no injunction at all should have been issued.

Eldred v. *Kessler*, as the Supreme Court itself remarked, was a case of novel impression, and in deciding it that court carefully confined the decision to the single point that the original judgment was conclusive upon the parties to it. As to the proposition that such adjudication afforded a defense to Breitweiser in the direct suit against him, it said, "Upon that question we express no opinion." It would seem that inferior courts should be cautious about extending the principle enunciated in that case beyond the limits within which it was there applied. The opinion opens up a new subject in patent law practice, and it is desirable, no doubt, that an early expression of opinion by the Supreme Court should be secured upon a record which will present its broader aspects, but we do not think it wise to certify the question to that tribunal upon this record. Besides that question there is the further one whether upon the merits of the whole case the Second Circuit was right in holding the patent to be valid and infringed by a manufacturer other than the Goodyear Tire and Rubber Co. Should the Supreme Court reach the conclusion

that this Circuit erred in that respect, the further application of the *Eldred* v. *Kessler* rule would no longer cut any figure in the case, and by certifying it now we would have unnecessarily vexed that tribunal with a moot question.

It would seem that the rights of all can be best preserved by affirming the order, at the same time directing the Circuit Court (upon the filing of a new bond or the extension of the old one) to suspend the operation of the injunction until final disposition of the cause. The record at final hearing will be so comprehensive as to present every question, and when it reaches this court upon appeal, a review of them can be secured from the Supreme Court either by certification or certiorari.

The order is affirmed, with the modification suggested as to suspension.

UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE SECOND CIRCUIT.

The Consolidated Rubber Tire Company and The Rubber Tire Wheel Company,
Complainants-Appellees,
vs.
The Diamond Rubber Company of New York,
Defendant-Appellant.

Before LACOMBE, COXE and NOYES, Circuit Judges.

On appeal from a final decree of the Circuit Court for the Southern District of New York entered March 2, 1908, sustaining the two claims of letters patent No. 554,675, to Arthur W. Grant, for improvements in Rubber Tired Wheels, ordering an injunction and an accounting. The patent was sustained by this court in an action by complainants against The Firestone Tire and Rubber Company, the decision being handed down on Jan. 30, 1907. (151 Fed., 237.) The opinion of

this court upon appeal from the order granting a preliminary injunction in the present action is reported in 157 Fed., 677.

CHARLES K. OFFIELD, C. C. LINTHICUM and PHILIP B. ADAMS, for appellant;

PAUL A. STALEY, BORDER BOWMAN, THOMAS W. BAKEWELL, CHARLES W. STAPLETON, for appellees.

COXE, J.

This appeal is in the nature of a re-argument of the questions decided in the Firestone case. It is not here upon newly discovered evidence for the additional testimony was as available in that case as in this. There is more testimony it is true, but it is cumulative merely. The counsel are the same, the issues are the same. The judge of the Circuit Court correctly states the situation as follows:

> "The question in this case was presented and tried out before Judge Platt and before the Circuit Court of Appeals; evidence was taken and experts examined. One side gave evidence that the wires would hold the tire firm and immovable, and the other side gave evidence that they would not. Now, in this case, you have called more experts giving the same kind of evidence, that the wires would not allow the tires to tip, but in my opinion that evidence is merely cumulative, and could not, in the nature of the case, present any such different result that this court would be justified in not following the opinion of the Circuit Court of Appeals. Of course, if your defense was that this defendant does not infringe, that would be an entirely different question, but the only question argued here is as to the validity or invalidity of the patent.
>
> "That question having been once tried out and a decision made, I do not see what right any other defendant had to go over the same evidence and call upon the court to go over it again, particularly when the decision of the Circuit Court of Appeals is controlling. In my opinion the only point in this case, that of the validity of the patent, has been decided by the Circuit Court of Appeals."

We think the judge was justified in so holding. If courts

are to examine defenses in patent cases *de novo,* as often as they are presented, litigation will continue until the resources of the defendants or the patience of the complainant, and possibly the patience of the court, are exhausted. The question of the capacity of the tires to rise slightly and re-adjust themselves when subjected to severe lateral strain was one of the principal questions litigated in the Firestone case, and, as we pointed out in our opinion, the tendency to do this was admitted by the defendant's expert. He says:

> "There is no doubt that when lateral pressure is applied to one side of the exposed portion of the tire, there is a tendency to roll the tire out of the channel."

The tests made in that case convinced us that this tendency actually existed and that we were safe in assuming, as established, a proposition about which the experts on both sides agreed and the truth of which was demonstrated in open court.

The impossibility of proving or disproving in any satisfactory manner the existence of this tipping tendency by the observation of the vehicle in actual use, or the examination of a worn-out tire, will be admitted after a moment's reflection. The human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction at an angle of 45 degrees. So, too, a worn-out tire with cuts and abrasions along its entire periphery may have the tipping capacity in question. The fact that tires have been produced in court which were rusted in the steel channel is not important, unless it be proved that they were subjected to severe lateral strain.

A tire used on asphalt pavements or on smooth park roads would probably remain in place if but one wire were used. We do not lose sight of the fact that the testimony shows that many of the tires from Chicago received rough usage, but this testimony avails little in face of the experiment which showed us the bottom of the tire rolled up by lateral strain and reseated the moment the strain was removed. This record

presents nothing new which would warrant us in changing our former decision.

Another volume of 500 pages has been added to the library which has accumulated during the last ten years through the efforts of many defendants who seem determined to use what they, in effect, assert to be useless device. The indomitable persistency with which these people have fought for the right to use the Grant tire is more persuasive evidence of its merits than the opinions of experts.

If the Willoughby, Latta and other tires are as good as Grant's, why do not these defendants use them? The almost frantic efforts which have been made to use the Grant tires are inconsistent with the argument that they show no inventive genius, and we are more and more convinced that we were right when we said that "no successful rubber tire can be made without embodying the distinguishing features of the Grant patent."

The decree is in the usual form, it restrains the defendant from any further infringement of the Grant patent and orders a reference to compute the profits and damages by reason of such infringement. Tires which do not infringe, the defendant is at liberty to sell. The presumption is that the complainants will not seek to prevent the defendant from doing a legal act and will not attempt to make it account for tires which it has a right to sell. Should such an attempt be made, it can be disposed of by the court upon facts then presented. Such questions frequently arise when the complainant attempts to compel an accounting for devices not passed upon by the court at final hearing.

When this cause was before the court upon an appeal from the order granting a preliminary injunction, we recognized as proper the following clause in the order:

> "Nothing in this injunctional order shall prevent, or is intended to prevent, or enjoin the defendant from handling, using or selling rubber tires and rims covered

> by the Grant patent, . . . manufactured by the Goodyear Tire and Rubber Company having a right to manufacture, use and sell such tires under a judicial decree in a litigation in the Federal Courts in the District of Indiana, heretofore pending between this complainant and such parties, wherein it has been judicially determined that said Grant patent is invalid and void."

We see no reason why this language should not be inserted in the decree and direct that it be amended accordingly. The amendment fully recognizes the applicability of the doctrine of *Eldred* v. *Kessler,* 206 U. S., 285, to the case at bar. Whether it should be given a broader interpretation is a question upon which we express no opinion, deeming it more prudent to wait until the facts are fully developed.

There is no occasion for attempting at this time to anticipate the future and to provide for a contingency which may not arise.

Having said what the defendant may not do, it is unnecessary and unwise to attempt, further than as above stated, the difficult task of telling what it may do.

The decision in *Eldred* v. *Kessler* must, of course, be respected by the complainants and followed by the master. If doubt should arise whether it applies to a given state of facts, the court can determine the right of the parties on learning what the facts are. It is safer to base decisions upon facts rather than upon conjecture. To provide in a decree that a defendant is not enjoined from making, using and selling devices which do not infringe or which have been licensed, seems unnecessary. The doctrine of *Eldred* v. *Kessler,* if carried to the extent contended for by the defendant, will introduce radical and far-reaching limitations upon the rights of patentees. These questions may not arise in the case at bar, but if they should, the court should have the facts, and all the facts, before attempting to decide them.

The decree is affirmed, with costs.

GOODYEAR TIRE & RUBBER CO. *et al.* v. RUBBER TIRE WHEEL CO. *et al.*

(Circuit Court of Appeals, Sixth Circuit. May 6, 1902.)

No. 1,071.

Before LURTON, DAY, and SEVERENS, Circuit Judges.

LURTON, Circuit Judge, after making the foregoing statement of the case, delivered the opinion of the court.

The subject of the controversy is the simple one of solid rubber tires for vehicles. When Grant entered the field as an inventor of rubber tires, he found it occupied by an army of patentees who had preceded him, and no less than 80 prior patents have been put in evidence as anticipations or as illustrations of this history of the art. Grant, in part, seems to recognize the crowded character of the field open to him, for he concludes an account of his construction by claiming that, by his mode of construction, he has produced "a rubber tired wheel rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market."

The first claim of the Grant patent is for a combination of three elements: First. A metallic channel rim, having angularly projecting flanges, shown as *b'* in Fig. 2, forming a channel with inclining sides, into which the rubber fits. Second. A solid rubber tire having an inner portion adapted to fit in the channel rim and an outer portion forming an angle or corner with the inner portion, the corner being somewhat below the top of the channel seat or metallic rim. Third. Independent retaining wires passing entirely through the rubber tires horizontally, and located below the outer periphery of the flaring sides of the channel seat. The drawings heretofore set out will better explain these parts, especially if examined in the light of the description of the patent also fully set out. The second claim is like the first, but adds a reinforcing strip of canvas across the bottom of the rubber tire.

Metal channel tire seats in great variety of form appear in the earlier patents. In some the sides of the metal channel incline inwards, and thus aid in holding the tire in place, and this method characterizes a class of rubber tired wheels, where retaining bands or wires were not used, as "clincher" tires. In others the sides of the channel rim are perpendicular; in others there were ribs or projections on the inside of such channel sides which served to assist in holding the tire in its seat. In still others the sides are shown to flare outwards to a greater or less degree, as in Grant's. The exposed portion of a rubber tire is liable to lateral expansion under compression from use, and to project over the sides of a metal channel or tire seat, and to be sheared or cut by such contact. Two ways of avoiding this kind of injurious cutting were taught in the old art, and in some cases both methods were combined. One obvious method was to round the edges of such rims. Another was to make the edges flaring; thus affording a space between the flaring side and the rubber tire into which the expanded tire might crowd itself without projecting over the edge of the metal seat. Methods for preventing such flaring effects appear very early in the art. Thus, in the English patent of 1884 to Clark, he says he forms his tire seat with "straight parallel sides slightly widened out at the mouth." In the United States patent to Owen of 1887, he recognized this cutting from lateral expansion under compression, and shows two or more forms of metal channel in which the edges of the rim are flaring at the top. To further guard against the trouble, he, after referring to this expansion under compression, says in his specifications:

> "I reduce the width of the tire outside of the rim or felly, making it either of a flat or concave form, or of other form falling within the semi-circle, so that when subjected to pressure the lateral expansion or enlargement will not cause the tire to project beyond the rim."

This, he says, is plainly shown by Figs. 5 and 6 of his drawings.

In the patents to Elliot, Nos. 440,701 and 440,702, the chan-

nel sides are shown to slightly flare. In one of his patents he says:

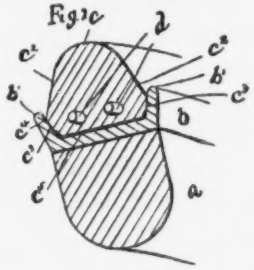
> "By making the metallic tire in this manner, the rubber tire, when compressed by a direct or lateral pressure, and thereby overlying the metallic edges, will not be cut or injured by said edges."

In the English patent to Willoughby, of 1892, No. 18,030, very many forms for metallic channel tire seats are shown, two of them showing a slight flaring at top of sides. Examples are also to be seen in Myers, of 1892, No. 468,971, and Beirsmith, of 1890, No. 424,452. In the English patent to Robertson of 1890, the same flaring sides are shown, and somewhat more emphatically than in any of the before-mentioned patents.

Grant describes his rubber tire as having a "peculiar shape." He says:

> It "is formed of substantially the same depth as width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of the rim, the exposed sides of the tire being formed, preferably, on the lines, c^2, at an angle to each other, and also to the flanges, b', of the wheel rim. The unexposed portion of the tire, or that portion which is inclosed within the rim, is formed of substantially the same shape as the inner channel of the rim, that is to say, it is tapered from the outside inwardly, so that the sides of the inner or unexposed portion of the tire are also formed on the lines, c^3, forming, with the lines, c^2, an obtuse angle."

This obtuse angle or corner he describes as falling below the outer periphery of the flanges, b', and within the channel between said flanges. The "peculiar shape" is better understood by reproducing Fig. 2 of his drawings:



The purpose of the patentee in adopting this "peculiar shape" for his rubber tire, as explained by himself in his specifications, is as follows:

> "By having the sides of the exposed and unexposed portion of the tire formed inclined, and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove, and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the openings, *c'*."

The rubber tire of Owen, before referred to, was primarily a velocipede tire, and was made of two layers of rubber, the outer part being cushioned on an unexposed and softer body of rubber. But the reasons which moved Owen for adopting the form shown in his patent for the crown or exposed portion of his rubber are strikingly like those set forth by Grant, and a comparison of Figs. 5 and 6 from the Owen patent with Fig. 2 of the Grant patent will show substantial unity of design, so far as the crown or exposed portion of the rubber in each is involved. In both the channel rim is flaring, in Grant's somewhat more so than in Owen's; but in each there is a space within which the compressed rubber may be crowded without projecting over the edge of the tire seat. In each the widest part of the rubber and the obtuse angle or corner are located "within the outer periphery of the flanges," which is the claim of the patent, and slightly "below the outer periphery of the flange, *b'*," which would fill even the letter of Grant's specifications, though Owen's drawings do not show this angle or corner to be so far below the periphery of the flanges as is shown by Grant's drawing. In the design patent to Coops, 1891, No. 20,678, is shown a design for a rubber tire which very clearly anticipates Grant's peculiar shape, including his corner or angle. So, in the English patent to Linton, there is a substantial anticipation of Grant's "peculiar shape." Grant's

rubber is shown to be provided with two openings or holes extending through the rubber longitudinally, through which are passed two independent retaining wires. These openings, when the rubber is in its seat, are "within the outer peripheries of the flanges." The ends of the wires are to be united together "after the rubber has been compressed endwise on said wires, thus forming two independent and continuous retaining wires within the rubber tire, the ends of which, by reason of the compression, are brought together so as to entirely cover the wires and the united ends thereof." Many methods of retaining the rubber in its seat on the tire are shown in the old art, and among them retaining wires. As far back as 1861, in the English patent to Parfrey, is shown a rubber tire retained by a "ring or hoop of inelastic material, preferring iron for such purpose;" the "rod" being passed horizontally through the rubber tire, the two "ends" being welded or otherwise connected together, producing a continuous "ring" of inelastic material at the core of the rubber ring. It is not stated whether this "ring" or "rod" of iron is to be round or flat. The patent is apparently a generic one so far as it points out the employment of a continuous band of iron extending longitudinally through the rubber ring as a means of retaining the rubber in its seat. The Claypool American patent of 1890 is also instructive in this matter of means for retaining the rubber by wires or tightening bands extending horizontally through interior of the rubber ring. He shows the use of either one or more tightening wires; the ends being either tied together, as in Grant's, or tightly tied to outer surface of the tire. Claypool's wires were not threaded through the circumferential opening in his rubber, but placed therein through a slit extending from his opening to the outer surface of the rubber, a slit which would tightly close when the wires were tightened to compress the rubber to base of rubber seat. Examples of the employment of two wires may be seen in the Robertson patent of 1890, the Willoughby patent of 1892, the

Welch patent of 1890, and the Timberlake patent of 1890, all English patents. In Willoughby the wires are coiled in parts to make them elastic, and are either threaded through circumferential openings or molded with the rubber. The Elliot patent, No. 440,702, shows a flat band or tape of iron passing longitudinally through the rubber at a point below the periphery of his metal channel sides. The ends of his iron band pass out through an opening in the tire and felly, and are secured to the inner surface of the felly. Elliot does not limit himself to a flat binding strip, though he says he prefers that form, and some of his claims are broad enough to cover a round binding wire such as is used by Grant.

We have gone far enough into the history of the old art, without, by any means, exhausting the subject, to show: First, that it was not new to set solid rubber tires into iron channels with flaring flanges, the widest part of the rubber being below the periphery of the channel sides; second, that it was not new to use solid rubber bands of the "peculiar shape" of that employed by Grant, so far as that shape has any substantial bearing upon the question of novelty here to be considered; and, third, that it was not new to use one or two or more wires for the purpose of retaining the rubber tightly in the channel seat. Practically, this is conceded by the learned counsel who have argued this case for appellees. But their concession has been accompanied with such narrow concessions as to the teaching of the old art, and with such wide claims for the concrete results of the combination of these old elements made by Grant, as to make it essential to show something of the old art and of the functions in that art of the elements of Grant's combination, that we may better understand the contention that the combination of the patent was new, and the result novel and patentable.

While conceding that the individual parts of the Grant claims are old, it is insisted by appellees that these parts have never been before brought into a combination where the parts

are so arranged as to co-operate in the production of a new and useful result. It may be conceded that no rubber tired wheel in the old art has been shown which includes each of the identical parts which unite to make Grant's tire. We find Grant's channel rim in one, his two or more wire system of attachment in another, his peculiar shaped rubber strip in still another. Again, we may find two of Grant's parts co-operating in one structure; the third being represented by something not quite the same, but accomplishing separately, possibly not so well, the same function attributed to Grant's third element. A careful study of the history of the art brings us very decidedly to the conclusion that the most that can be claimed for Grant is that he has selected those old parts which he deemed could be most advantageously employed together, and has produced a rubber tired vehicle wheel which is probably more durable than any one rubber tired wheel theretofore known to the industry. To combine old parts in such manner as to produce a new result by their harmonious co-operation may be patentable; but it is equally true that where the combination is not only of old parts, but of old results, without the addition of any new and distinct function, the combination is not patentable. *Hailes* v. *Van Wormer*, 20 Wall. 353, 22 L. Ed. 241; *Pickering* v. *McCullough*, 104 U. S. 310-318, 26 L. Ed. 749; *Florsheim* v. *Schilling*, 137 U. S. 64-77, 11 Sup. Ct. 20, 34 L. Ed. 574; *Knapp* v. *Morss*, 150 U. S. 221-227, 14 Sup. Ct. 81, 37 L. Ed. 1059; *Office Specialty Mfg. Co.* v. *Fenton Metallic Mfg. Co.*, 174 U. S. 492-498, 19 Sup. Ct. 641, 43 L. Ed. 1058; *Stearns & Co.* v. *Russell*, 29 C. C. A. 121, 85 Fed. 218; *Overweight Counterbalance Elevator Co.* v. *Henry Vogt Mach. Co.*, 43 C. C. A. 80, 102 Fed. 957, 961, 962; *Brinkerhoff* v. *Aloe*, 146 U. S. 515, 516, 13 Sup. Ct. 221, 36 L. Ed. 1068; *Reckendorfer* v. *Faber*, 92 U. S. 347, 23 L. Ed. 719; *Muller* v. *Tool Co.*, 23 C. C. A. 357, 77 Fed. 621-628.

In *Overweight Counterbalance Elevator Co.* v. *Henry Vogt*

Mach. Co., cited above, this court, speaking by Judge Severens, said:

> "There is no invention in merely selecting and putting together the most desirable parts of different machines in the same art, where each operates in the same way in the new machine as it did in the old, and effects the same result. No principle of the patent law stands on plainer reasons than this. A somewhat leading case on this subject is *Hailes* v. *Van Wormer*, 20 Wall. 358, 22 L. Ed. 241, and the principle is illustrated by the decisions of this court in the following cases: *Manufacturing Co.* v. *Robbins*, 43 U. S. App. 391, 21 C. C. A. 198, 75 Fed. 17; *Stearns* v. *Russell*, 54 U. S. App. 591, 29 C. C. A. 121, 85 Fed. 218; *Campbell Printing Press & Mfg. Co.* v. *Duplex Printing Press Co.* (decided at this term), 41 C. C. A. 351, 101 Fed. 282. It is, of course, conceded that when the assembled old elements effect a new mode of operation, producing a more beneficial result, this rule does not hold. In such case a deeper insight leading to the perception of new results from new co-ordinations of old elements may be exercised in a degree amounting to invention. The distinction is clear, though it may happen, as it constantly does in the application of other principles, that difficulty may be found in cases which hover along the line between the mere assembling of old elements and the putting them into such relations that, co-acting, they have a different and more beneficial mode of operation."

The mere bringing together of old parts and allowing each to work out its own old effect without producing some new machine or product is not invention. A combination of old elements, to be patentable, "must produce a different force or effect or result, in the combined forces or processes, from that given by their separate parts. There must be a new result produced by their union; if not, it is only an aggregation of separate elements." *Reckendorfer* v. *Faber*, 92 U. S. 347-357, 23 L. Ed. 719. "In a patentable combination," said Mr. Justice Matthews, speaking for the court in *Pickering* v. *McCullough*, cited above, "of old elements, all of the constituents must so enter into it as that each qualifies every other. . . .

It must form either a new machine of a distinct character and function, or produce a new result due to the joint and co-operating action of all the elements, and which is not the mere adding together of separate contributions. Otherwise it is only a mechanical juxtaposition, and not a vital union." From the settled law as shown by the cases we have cited, it is plain, that to sustain Grant's patent for a combination of old parts, taken from the same identical art, it must appear either that he has produced a new article of manufacture, or a new machine having a distinct character or functions, or a new result must have been obtained in rubber vehicle tires which is due to the joint and co-operating action of all the old devices. We may dismiss from consideration any inquiry as to whether Grant's construction constitutes either a new machine or manufacture having distinct characteristics or new functions, for no such claim has been advanced. Has, then, a "new result" been obtained, and is that result due to the mechanical co-operation of all the old parts of the combination? That the rubber tire produced by Grant has proven a more satisfactory tire in point of stability and endurance is urged as evidence of a "new result." In *Loom Co.* v. *Higgins*, 105 U. S. 580, 591, 26 L. Ed. 1177, the patent was for a new arrangement of elements separately known before, by which a loom was able to produce 50 yards a day when it had never produced more than 40 before, and was held patentable. In that case Justice Bradley said:

> "It may be laid down as a general rule, though, perhaps, not an inviolable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention."

This rule, thus cautiously stated, has been approved in later cases. *The Barbed Wire Patent*, 143 U. S. 283, 12 Sup. Ct. 443, 36 L. Ed. 154; *Muller* v. *Tool Co.*, 23 C. C. A. 357, 77 Fed. 621-628. But in both the cases cited there was a new result, and in both cases the only question was whether this

new result constituted invention or mere mechanical improvement. Now, if Grant's construction is an aggregation of well-known parts, each part doing its own appropriate function in substantially the old way, it does not show a patentable invention, even though the sum of all the old results is a tire more serviceable or durable than shown in the old art. *Hailes* v. *Van Wormer*, 20 Wall. 353, 22 L. Ed. 241; *Office Specialty Mfg. Co.* v. *Fenton Metallic Mfg. Co.*, 174 U. S. 492-498, 19 Sup. Ct. 641, 43 L. Ed. 1058; *Richards* v. *Elevator Co.* 158 U. S. 299, 15 Sup. Ct. 831, 39 L. Ed. 991; *Overweight Counterbalance Elevator Co.* v. *Henry Vogt Mach. Co.*, 43 C. C. A. 80, 102 Fed. 949; *Smith* v. *Nichols*, 21 Wall. 112, 22 L. Ed. 566.

But it is said that Grant has made a combination of parts never before used together, and that he has so arranged the parts used as to obtain the co-operative action of all the parts, and, by such joint action, has produced a new result in a rubber tire more useful and durable than any theretofore known. The claim that the old parts selected from old combinations do not operate in their new association substantially as they did in the combinations from which Grant took them is the turning point of the case. It cannot be denied that there is a certain kind of co-operation in the accomplishment of the result aimed at between each of Grant's elements. The object is to attach a solid band or strip of rubber to the periphery of a vehicle wheel. Now, the channel rim adapted to fit the lower part of the rubber, the rubber adapted to fit within the channel sides, and the fastening bands or wires used to assist in the retention of the rubber band in its position on the periphery of the vehicle wheel, are each contributing to the one common purpose. But that kind of co-operation is not new, for it necessarily existed in every prior structure where a channel rim with flaring sides was found in association with fastening wires as a means of retaining the rubber in its seat. But do they co-operate in any new way or produce any new result by

reason of anything which Grant has done? What he set himself to do was to attach a rubber tire to a vehicle wheel in such a way as that it would best retain its position with the least amount of cutting and waste. To adapt his rubber to his channel rim, and to retain it in the latter by means of fastening bands of iron or circumferential wires, was old and well known. He adopted wires preferably to a band or tape of steel. The old art taught him that it was best to use two wires, one on either side, in preference to a flat band or a single wire. He found that the exposed crown of the rubber was subject to compression when in use, and liable to be pressed laterally over the edges of the iron channel in which it was seated. He found that the old art taught that this might be guarded against by making his channel sides incline outwards at the top, thereby leaving a space into which the lateral extension of the exposed crown of the tire might be crowded. This teaching of the art he adopted, and he selected that form of channel rim which gave him this protection against the cutting or grooving of his rubber. He also found that in the old art, notably in the patent to Owen, this danger of cutting under lateral pressure was diminished by reducing the width of the rubber tire above the flanges of the channel rim, and giving it such form "within the semicircle" as that, when subjected to lateral expansion or enlargement, will not cause the tire to project beyond the rim. From the drawings of this Owen patent, and from the teaching of the Owen invention, in reference to the best plan for avoidance of cutting under lateral expansion, comes the shape of Grant's rubber tire above the flanges; for Owen shows the corner or obtuse angle below the periphery of the channel sides substantially as in Grant. The location of the two retaining wires below the periphery of the rim flanges was also taught in the old art. It is shown in a number of structures, including the Willoughby, Welch, Robertson and Timberlake. In Elliot his retaining band is located

below the periphery of his channel flanges, and in Claypool's just below or in line with the top of the channel sides.

Up to this point, it is to us very evident that each of the old parts selected from the old art produces in its new relation substantially the same result which was characteristic of it in the combination from which it was taken. While there is in some sense a co-operation of all the parts, for even the reenforcing strip across the bottom of the rubber ring contributed to hold the rubber in its seat by enabling it the better to resist the cutting effect of the wires under a great strain, we are unable as yet to perceive that the parts co-operate in any new way, or that any new function has resulted from the new combination. The apparent function of each of the old parts in the new arrangement is the precise function of the same parts in the old combinations from which they were taken. The combined result is seemingly but the sum of the old results of the same parts, when used in former structures of the same kind. But the appellees contend that Grant's channel rim, rubber tire, and retaining wires do, as a consequence of their relation to one another in his combination, perform a new function, or operate in a new way to produce a new result; and that this new mode of operation is novel and beneficial, and constitutes invention. Oddly enough, the new mode of operation to which the novelty of Grant's combination is attributed is not mentioned in the specifications, and its discovery is due to the keen optimism of professional experts. This new capacity claimed for Grant's structure is a supposed capability of his rubber for lateral movement. This new function, says Mr. Livermore, an expert witness for the appellees, "consists in permitting the tire to rise slightly from the rim at either side independently of the other when subjected to very great strain, and to immediately reseat itself when such strain is removed." It is claimed that in the old art the struggle was to fasten the rubber in its seat as securely as possible, but that Grant discovered that this was a mistake, and that "the real

problem was to construct a rubber tire in such manner that the rubber would be permanently and positively held upon the rim of the wheel, and yet of such form that would permit the rubber some movement forward or backward and to either side as well." Again, counsel says, "the problem was certainly paradoxical, in that the rubber must be held as securely as possible, and yet must not be held too rigidly. Others tried to prevent any movement. Grant's construction was such that the rubber could have some movement." To secure this capacity for some movement of his tire, counsel say Grant has "so arranged and emphasized the importance of the relative arrangement of the wires, channel iron, and rubber in relation to and in co-operation with each other, that under extraordinary conditions the parts operate together, so that a severe lateral strain on either side of the rubber tire is compensated and allowed for by permitting the rubber to yield and move in the channel, and reseat itself after the strain." "This arises," says counsel, "from the wide, open channel, the angle or corner or widest portion of the tire being just below the mouth of this channel, and the independent retaining wires, which permit the tire, under severe lateral strain, to rise slightly on either side and reseat itself, thus relieving that part of the tire which meets the obstacles from the severe shock which might otherwise tear it asunder at this point." "To secure this result," says the expert, "it is essential to have, as in the Grant tire, two independent fastening wires, one at each side of the middle and normally below the level of the flanges of the rim, so that one will remain in normal position and prevent displacement of the tire to such an extent as to preclude its returning to normal position while the other is yielding to relieve the tire of excessive strain." The witness continues by saying: "If a single central fastening wire were used, there would be danger of the tire rolling around it as a center, and becoming displaced, so that it would not reseat in normal position when it would not properly perform its other functions,

but would be liable to be cut and damaged, since its immunity from cutting depends upon the form of the channel and rubber, and upon the two being retained in their normal working relation to one another. If a single fastening, or even two fastenings, were placed high up in the body of the rubber, above the level of the tops of the flanges of the rim, they would be liable to yield sufficiently to lift clear over the rim flange, so that the tire would at once fall off." It is very plain that the degree, if not the very existence, of this capacity for "side tipping," depends upon the tension of the retaining wires. To tighten the wires to their utmost tension must in the very nature of things compress the rubber beneath them as much as its elasticity will permit. It must therefore follow that Grant's retaining wires must not be tightened to the highest tension of the wires, for, if that is done, there can be no beneficial yielding of either rubber or wire under a violent lateral strain, and either the rubber must be cut by the wire, or the wire break, before there can be any "rising" of the rubber tire on one side to meet such strain. This dependence of this supposed new function upon the tension of the retaining wires was recognized and emphasized by Judge Thomas in *Rubber Tire Wheel Co.* v. *Columbia Pneumatic Wagon Wheel Co.* (C. C.), 91 Fed. 978-980, where this patent was sustained upon the ground, mainly, if not entirely, that this function of yielding laterally under violent pressure from one side was a new function, the fruit of the joint action of all parts of Grant's combination. In that case Judge Thomas, in describing the functions of the parts, said, in speaking of Grant's two independent wires, that "the ends of each wire are fastened together, *after having been drawn sufficiently tight to hold the rubber within the channel, but not so rigidly as to prevent the rubber moving slightly in its seat, and thereby to a degree yielding to any force opposing the progress of the wheel.* This latitude of movement, together with the elasticity of the rubber, permits the tire to accommodate itself to the obstacles with which it

comes in contact when the wheel is in motion. This lateral movement allowed to the rubber, whether rising from its *permissible turning on the wires* or from its own elasticity, or both, and the adaptations which, notwithstanding such movement, tend to preserve the tire from abrasion by the rim, are essential features of the tire." (The italics are ours.) That this capacity for side tipping or lateral movement under violent lateral strain is an operative function inherent in the particular arrangement of the old parts constituting Grant's combination is dependent wholly upon expert opinion. Its actual presence from practical experience or observation is not shown. Neither are the experts able to deduce this function from the instructions of the patent concerning the construction of the wire, for the patent is silent in respect not only to the function itself, but as to the proper tension of the wires in order to obtain it beneficially. Nor do the experts now advise us as to the proper tensile strength of the retaining wires to be used, nor as to the proper degree of softness or hardness of rubber below the wires in order to secure the highest degree of noncutting and nontearing strength in the rubber under the wires. Indeed, the experts admit that they do not know the tensile strength of either wire or rubber used by Grant, or of that the best adapted for use. The advantage which is claimed for this alleged capacity of side tipping or tilting is that thereby the wire is prevented from cutting or tearing through the thin body of rubber between it and the base of the rim in which it sits. The expert Livermore, so often referred to heretofore, says touching this capacity:

> "If, therefore, the tire should be subjected to a severe lateral strain, such as would be sufficient to tear it apart if all borne on the rubber between the fastening rim at the point where the pressure is applied, . . . the fastening wire on that side, . . . by reason of the compression of the rubber lying between it and the bottom of the channel entirely around the rim, can rise or yield to the excessive strain applied to the rubber, and thus relieve the latter before it is in danger of being torn apart."

But if the retaining wires were tightened to their full tension when their ends were welded or otherwise united, this capacity "to rise or yield to the excessive strain applied to the rubber" is not shown to exist. The degree, then, of this new capacity is clearly dependent upon the normal tension of the retaining wires. If this element of the proper tension of the retaining wires be eliminated, we have no foundation whatever for supposing that this capacity for lateral movement exists to any beneficial extent as a result simply of Grant's combination and arrangement of old elements. If the wire on the side from which a strong shock has come gives or rises, and the rubber turns on the wire and upon the opposite corner of the rubber, as on a pivot, it is because of some capacity of the wire to thus move laterally under strain, due to the fact that it was capable of some further tightening without breaking, and the rubber of some further yielding, by reason of its natural elasticity, without tearing. But, if these capacities of the wire and of the rubber have been practically exhausted by reason of the tension originally put upon them, there can be no beneficial capacity for side movement of either under severe lateral strain. The specifications give no hint of this alleged joint action of all the parts to produce this tipping action, or of the advantage therefrom in preventing the tearing or cutting of the rubber under the wires. If this capacity for side movement be a beneficial function plainly inherent in Grant's combination and arrangement of old parts in relation to each other, and not a mere "obscure property lurking in some accidental corner of his device," it was not essential that the patentee should point it out as one of the advantages of his structure. This is because he has invented a machine, structure, or manufacture which includes in its necessary mode of operation the function in question, and, whether the inventor knew or not the full measure of the beneficial functions of his structure, he is entitled to all the uses of his invention. *Goshen Sweeper Co.* v. *Bissell Carpet Sweeper Co.*, 19 C. C. A. 13-20, 72 Fed.

67; *Dowagiac Mfg. Co.* v. *Superior Drill Co.* (decided by this court at present term), 115 Fed. 886; *Wells* v. *Curtis*, 13 C. C. A. 494-498, 66 Fed. 318. In *Goshen Sweeper Co.* v. *Bissell Carpet Sweeper Co.* and *Dowagiac Mfg. Co.* v. *Superior Drill Co.*, both cited above, we held the patentees entitled to all the advantages of their devices, whether pointed out or not. But in both cases the advantage or function resulting in the advantage was a property or function plainly inherent in the very structure or device when constructed according to the drawings and specifications of the patent. In both cases the description of the invention was so full that if followed the particular function or advantage pointed out would result as a necessary consequence of the law of the structure. But this is not so in respect to the undescribed function of the Grant device, for he neither mentions any such capacity, nor describes such an arrangement of his retaining wire as will secure a capacity for "rising or yielding" under lateral strain as a necessary result of the tension so provided for. The problem, so far as the public is concerned, is to remain a problem. The old art, say counsel, taught the necessity of a very secure attachment of the rubber in its rim. The inventor, according to the claims now made by him, turned his back upon all the teachings of the old art in this matter, and struggled to secure his rubber so that it should hold its place, and yet should be capable of some side movement as a means of yielding to violent side blows, instead of persistently resisting at the expense of a torn rubber or a broken wire. We learn now that this capacity for any beneficial yielding is dependent upon the wires being properly adjusted originally, and that this proper tension depends upon the right judgment of the workman. If this tipping capacity had been pointed out, and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved, though this we need not consider. But neither the advantage of such a function, nor any hint that it is in any wise dependent upon the

normal tension of the retaining wires, is to be found in the patent. How, then, is it possible for the public to obtain a knowledge of this new function, its advantages, or how best to secure the proper tension of the wires to allow of this capacity? If it exists in Grant's arrangement of old parts, it is an accidental mode of operation dependent upon the normal tension of the retaining wires in the particular tire. It is the duty of a patentee to disclose his invention, that the public may be able to practice it when the monopoly expires. This disclosure should include the mode of operation as well as a method of construction. Grant has not disclosed this alleged capacity of his structure for rising or yielding on one side under severe lateral strain, nor has he disclosed any method of securing same by the proper arrangement of the retaining wires to produce the proper tension upon which this capacity in any beneficial sense depends. *Bates* v. *Coe*, 98 U. S. 31-39, 25 L. Ed. 68; *Wells* v. *Curtis*, 13 C. C. A. 494, 66 Fed. 318; *Kelly* v. *Clow*, 32 C. C. A. 205-212, 89 Fed. 297. Eliminating this alleged new feature, we are unable to find in Grant's combination any new mode of operation or any new result. As was said about another inventor in another case, Grant has shown great industry in acquiring knowledge of what others had done or taught in the attempt to make a marketable rubber tire wheel, and has shown good judgment in selecting from earlier structures or earlier teachings the best of the devices thus made known, and good judgment in combining them with mechanical skill. But we can discover no trace of invention or original thought, for his parts as combined do substantially the same operations which they did in the combinations from which he took them. He has united the most beneficial features of other patents, and in that sense has made a new combination. But he has not produced a new manufacture or a new result in a patentable sense. He cannot be said in any true sense to have taken the much talked of "last step." His steps are all in the tracks of those who have gone before.

Rubber tired wheels had been successfully made for many years. The Elliot wheel, exhibited, is shown to have been used more than five years without being yet worthless. Grant's tire may be in some respects an improvement upon any particular structure, but it is an improvement not due to any new mode of operation, and the parts contribute to the common result just what they did in the combinations from which they were taken. Much of the superiority, or rather superior durability, of Grant's tire, is undoubtedly due to the quality of the rubber used, in respect to which there has been in late years a great improvement.

Much stress has been laid upon the commercial success of the Grant tire. Aside from the fact already mentioned, that much of the durability of the tire is due to the better quality of rubber used, there is much evidence that this success is to be largely attributed to the power of great capital in buying or crushing out rivals, and to great business push and advertising. There is too much evidence in this record as to consent decrees against rival makers of tires to predicate much upon the mere fact that the Grant tire has met with a large sale. The general use of a patented article is only evidence of value when the novelty or utiliity of the article is a matter of great doubt, and its evidential value in even such cases is nothing when it can be attributed to something other than novelty. *Watch Case Co.* v. *Robbins*, 21 C. C. A. 199, 75 Fed. 17; *Lane* v. *Welds*, 39 C. C. A. 528, 99 Fed. 286; *McClain* v. *Ortmayer*, 141 U. S. 419, 12 Sup. Ct. 76, 35 L. Ed. 800.

Believing the patent to be void for want of patentable novelty, we need not consider any question of infringement. Reverse the decree and dismiss the bill.

RUBBER-TIRE WHEEL CO. *v.* VICTOR RUBBER-TIRE CO.

(Circuit Court of Appeals, Sixth Circuit. June 2, 1903.)

No. 1,169.

Before LURTON, SEVERENS, and RICHARDS, Circuit Judges.

LURTON, Circuit Judge. This is a bill to restrain infringement of patent No. 554,675 to A. W. Grant, dated February 18, 1896, for improvements in rubber-tired wheels. The defense was that the invention was void for want of patentable novelty, anticipation, and noninfringement. Upon a final hearing upon pleadings and evidence the bill was dismissed upon the authority of *Goodyear Tire & Rubber Co. et al.* v. *Rubber-Tire Wheel Co. et al.*, 53 C. C. A. 583, 116 Fed. 363. The parties not being the same, the former opinion would not absolutely preclude this court from renewing the inquiry into the validity of the Grant patent.

But an additional obstacle to a reconsideration of the merits of the question is found in the fact that the Supreme Court has since denied the appellant's application for a writ of certiorari, although the decree had held the patent void. *Rubber-Tire Wheel Co.* v. *Goodyear Tire & Rubber Co.*, 187 U. S. 641, 23 Sup. Ct. 842, 47 L. Ed. ——. This fact would seem to somewhat interfere with the freedom of this court, for we should seemingly place ourselves in the attitude of reopening, upon substantially the same evidence, the question of the validity of the Grant patent after the Supreme Court under its revising powers had refused to re-examine the case. In *Rawson* v. *Western Sand Blast Co.* (C. C. A.) 118 Fed. 576, the Circuit Court of Appeals for the Seventh Circuit under like circumstances said:

> "Though the former case might not prevent a renewed inquiry into the merits of the Evans patent, we are persuaded that the pronouncements therein, in view of the Supreme Court's denial of appellant's application for a writ of certiorari, should in the interest of faith in the

stability of judicial decisions be adhered to by us as the law of the patent."

We do not find it necessary, however, to resort to any technical ground for adhering to the former opinion of this court, denying validity to the patent here involved, for we have no reason to doubt the rightness of the conclusion there announced.

Decree affirmed.

No. [illegible]

Supreme Court of the United S[illegible]

OCTOBER TERM, 1[illegible]

DIAMOND RUBBER COMPANY OF NEW YORK[illegible]

vs.

CONSOLIDATED RUBBER TIRE COMPANY [illegible]
RUBBER TIRE WHEEL COMPANY.

BRIEF OF RESPONDENTS [illegible]
PETITION FOR WRIT OF CE[illegible]

CHES[illegible]

STALEY & BOWMAN,
THOMAS W. BAKEWELL,
FREDERICK P. FISH,
Of Counsel.

S. H. Thompson & Co. Law Printers, St. Louis.

Supreme Court of the United States,

OCTOBER TERM, 1908.

DIAMOND RUBBER COMPANY OF NEW YORK,
Petitioner,

VERSUS

CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY,
Respondents.

BRIEF

Of Respondents-Complainants, to Petition for Writ of Certiorari.

The Diamond Rubber Co. of New York applies for a writ of *certiorari* directed to the United States Circuit Court of Appeals for the Second Circuit to review the mandate of that Court unanimously affirming the decree of the United States Circuit Court for the Southern District of New York.

The patent in suit was granted February 18, 1896. The early expiration of its term, on February 18, 1913, is a reason why the litigation should not be unnecessarily prolonged.

Nothing is involved in this suit more than is involved in an ordinary suit for infringement of letters patent. It involves no questions of public policy or public interest—merely a matter of private interest—nor the determination of any constitutional ques-

tion of law, for the issues presented upon the pleadings and proofs are issues of fact concerning the patentability of the subject matter of the claims, and only require for their determination the application of elementary propositions in the law of patents.

Nor, as we shall show, is there any conflict of opinion regarding this patent between the Courts of Appeal. The decisions of the Circuit Courts of Appeal of the Sixth and Second Circuits, though different in their conclusions—for the first decision held the patent to be invalid, and the second held it to be valid—were predicated upon substantially different proofs, and the Court of Appeals for the Second Circuit expressly stated (Petition, p. 41) that

> **"in view of this new aspect of the case, we have no reason to doubt that on the present record the Court of Appeals of the Sixth Circuit would reach a result favorable to the patent."**

Under such circumstances, notwithstanding that the patent had been held to be invalid by one Court and valid by another Court, we submit that there is no reason for the grant of the writ.

A writ of *certiorari* was refused in a similar case by this Court in *Stanley Instrument Co. vs. Westinghouse Electric & Manufacturing Company*, 195 U. S., 633, where the record showed that the Court of Appeals for the Second Circuit had held that the patent of Tesla there in suit was invalid because of anticipation by a prior publication, and that the proofs offered by the complainant were inadequate to antedate that publication *(Westinghouse Electric & Manufacturing Company vs. Catskill Company*, 121, F. R., 831) ; and in a later suit on the same patent, against another defendant, the Circuit Court of Appeals for the First Circuit had held the patent to be valid because the new proofs were adequate to show Tesla's invention to have been prior to to the publication in question *(Westinghouse Electric & Manufacturing Company vs. Stanley Company*, 133 F. R., 167).

The case at bar is strictly a controversy between private parties. Nothing is presented that justifies the petitioner in asking this writ.

The Question Decided in the Litigation on the Patent in Suit.

The Grant patent in suit is for a rubber tire of peculiar and novel shape, attached to the channel-shape rim of the wheel in a peculiar way, by two rings of wire which pass through channels in the rubber below the edges of the channel and encircle the wheel.

The proofs show that the designing of a successful rubber tire for vehicles had been a problem of unusual difficulty; such tires are frail and easily torn and displaced by the severe strains to which they are subject. The problem was first solved by Grant, the patentee of the patent in suit, and his tire has so successfully met the difficulties to be overcome that it has displaced all other forms of rubber tire for pleasure carriages and other light vehicles; and notwithstanding the specific character of the invention, the defendant and other makers of tires persist in copying it in the precise form in which it is illustrated in the patent. All attempts to obtain equally useful results by changing the shape of the tire have failed.

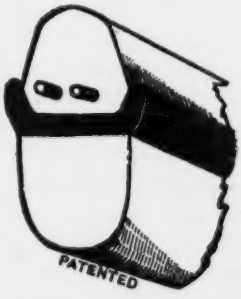
The long continued success of the Grant tire can only be explained on the hypothesis that it possesses some new and useful properties not possessed by tires of any other form.

The Court of Appeals for the Second Circuit, in the suit of these complainants against the Firestone Tire and Rubber Company, said (Petition, p. 39):

> "Grant's claims cover combinations composed of elements which, when considered separately, were all old, but which were combined by him to form a structure, which, for the first time, placed in the hands of vehicle owners a perfect rubber tire. From the crudities, oddities, total failures and partial successes which had preceded him he constructed a tire which became popular almost from its inception. This was not the result of chance or the haphazard selection of parts; his success could only have been achieved by a careful study of the scientific and mechanical problems necessary to overcome the defects which rendered the then existing tires ineffective and useless. The problems demanded the exercise of faculties far above those possessed by the skilled mechanic. Few patents have received such immediate and well-nigh unanimous recognition. For years

carriage manufacturers had been making strenuous efforts in this country and in Europe to secure a practical rubber tire. The moment Grant's structure appeared it was adopted by all the large manufacturers and to-day it is no exaggeration to say that no successful rubber tire can be made without embodying the distinguishing features of the Grant patent. Persistent efforts have been made to evade it, but without success. The tire described and claimed in the Grant patent is the standard rubber tire of to-day. This popularity may be accounted for in part by the financial ability of the owners of the patent to promote sales, but it was a most inconspicuous part. The hard-headed men of trade do not place themselves in a position where they must accept the alternative of an infringement suit or the payment of license fees for the use of an article, when an equally good article may be had for nothing. It should be and is the desire of the court in approaching the consideration of a patent for a structure which has thus won a position of unchallenged supremacy in the commercial world, to endeavor to sustain rather than defeat the claims. The combination of the patent operates, we think, to produce a new result or an old result in a manner which is a vast improvement over anything in the prior art. The Grant tire has the capacity, which no other possesses, of readjusting itself, after yielding to severe lateral strain, without tearing or abrasion of the rubber or injury to any of the parts.

The Tire in Controversy.



The accompanying drawing shows the Grant rubber tire applied to the steel channel which constitutes the rim of the wheel. The upper

portion of the tire is substantially of parabolic form; at its lower portion it has inwardly projecting sides and a flat base. It is set within the iron channel-shaped rim so that the corners of the rubber and the encircling wire rings are somewhat below the upper edges of the iron rim. The construction is defined in claim 1 of the patent in suit as follows:

> "1. A vehicle wheel having a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, an independent ring of wires passing entirely through the inner portions of said tire and also within the outer peripheries, substantially as described."

The use of retaining wire rings wholly unattached to the metallic rim enables the tire to tip laterally within the channel in either direction when it is subjected to side stress in passing over stones on the street or engaging with the curb or with the rails and slots of street railway tracks, and when the stress is relieved and reseat itself in its place in the channel and the flaring sides of the channel and the downwardly converging sides of the base of the rubber permit the tire to reseat itself without jamming against the edges of the channel or abrading or cutting the rubber. All the parts of Grant's device, therefore, co-act to produce a new and highly useful result, not attainable by any device of the prior state of the art. The mode of operation of the tire was stated as follows by complainant's expert in the suit of the complainants against the Firestone Tire and Rubber Co., and his deposition form part of the record in the case at bar:

> "The arrangement of the fastening wires shown in the Grant patent *provides an elastic cushion or rubber between each wire and the bottom of the channel in the rim,* and any strain tending to lift the tire, or to tip it laterally in the rim is resisted by the fastening wire at that point, while the fastening wire itself is yielding on the cushion of rubber between it and the bottom of the channel extending entirely

around the wheel. Therefore, the strain instead of being resisted by an unyielding fastening, meets a yielding resistance and is distributed so that the point at which strain is directly applied does not have the entire strain concentrated upon it, and is not liable to tear or break away from the fastening as it would be if such yielding action were not provided for by the fastening itself.

"By having the fastening wires independent of one another, one of them may yield to relieve the strain at that point, when, as is usually the case, there is a tendency of one side of the rubber to rise from the bottom of the channel, while the other side remains at the bottom of the channel. Thus, the fastening which is principally subjected to the strain may yield to distribute that strain, while the other fastening remains unaffected and tends to prevent the complete dislodgment of the tire from the rim.

"The outwardly flaring form of the channel and corresponding form of the unexposed portion of rubber seated therein, admits of such yielding side rocking of the rubber or the rise of one side slightly from the bottom of the channel, as is necessary to relieve the strain at that point, and then admits of and facilitates the reseating of the rubber, or its return to a normal position in the bottom of the channel, as soon as the dislodging strain has ceased to act."

It is evident that Grant appreciated the utility of his invention and knew that all the elements of his device were necessary to success, for the specification of the patent in suit states:

(P. 1, line 74): "In this groove or channel I place a rubber tire *c*, *which is of peculiar shape.*" * * *

(Line 83): "The tire has been described thus minutely because the constructions described are important."

(P. 2, line 3): "It has been found in practice that by the constructions above described I produce a rubber-tired wheel-rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market."

In the suit of these complainants against the Goodyear Tire & Rubber Company decided by the Circuit Court of Appeals for the

Sixth Circuit (Petition, p. 53), that Court expressly ruled that if these useful functions of the Grant tire had been set forth in the patent their decision might have been different, or if it had been properly proved in the testimony that these functions pertain necessarily to the Grant tire when constructed as stated in the claim the effect would be the same as if it had been recited in the specification, because of the rule that a patentee is entitled to all the benefits necessarily arising for his invention whether they be stated in the specification or not. The Court, however, held that the testimony on this subject in the record before it consisted solely of the opinions of experts and was not adequate to establish the fact that the properties in question necessarily belonged to the Grant tire. The Court held that the patent was invalid because the record failed to prove that Grant's tire was more than an aggregation of old forms and parts with no distinctively new result or function.

That this was the ground of the Court's decision appears clearly in the opinion which is printed on page 53 of the Petition (italics ours):

> "It may be conceded that no rubber tired wheel in the old art has has been shown which includes each of the identical parts which unite to make Grant's tire. We find Grant's channel rim in one, his two or more wire system of attachment in another, his peculiar shaped rubber strip in still another. Again, we may find two of Grant's parts co-operating in one structure; the third being represented by something not quite the same, but accomplishing separately, possibly not so well, the same function attributed to Grant's third element. A careful study of the history of the art brings us very decidedly to the conclusion that the most that can be claimed for Grant is that he has selected those old parts which he deemed could be most advantageously employed together, and has produced a rubber tired vehicle wheel which is probably more durable than any one rubber tired wheel theretofore known to the industry. To combine old parts in such manner as to produce a new result by their harmonious co-operation may be patentable; but it is equally true that where the combination is not only of old parts, *but of old results, without the addition of any new and distinct function, the combination is not patentable.*"

(p. 60): "The mere bringing together of old parts and

allowing each to work out its own old effect without producing some new machine or product is not invention. A combination of old elements, to be patentable, 'must produce a different force or effect or result, in the combined forces or processes, from that given by their separate parts. *There must be a new result produced by their union; if not, it is only an aggregation of separate elements.*'"

(p. 61): "Has, then, a 'new result' been obtained, and is that result due to the mechanical co-operation of all the old parts of the combination?"

(p. 62): "But it is said that Grant has made a combination of parts never before used together, and that he has so arranged the parts used as to obtain the co-operative action of all the parts, and, by such joint action, has produced a new result in a rubber tire more useful and durable than any theretofore known. The claim that the old parts selected from old combinations do not operate in their new association substantially as they did in the combinations from which Grant took them is the turning point of the case."

(p. 64): "But the appellees contend that Grant's channel rim, rubber tire, and retaining wires do, as a consequence of their relation to one another in his combination, perform a new function, or operate in a new way to produce a new result; and that this new mode of operation is novel nnd beneficial, and constitutes invention. Oddly enough, the new mode of operation to which the novelty of Grant's combination is attributed is not mentioned in the specifications, *and its discovery is due to the keen optimism of professional experts.*"

(p. 67): "That this capacity for side tipping or lateral movement under violent lateral strain is an operative function inherent in the particular arrangement of the old parts constituting Grant's combination *is dependent wholly upon expert opinion. Its actual presence from practical experience or observation is not shown.* Neither are the experts able to deduce this function from the instructions of the patent concerning the construction of the wire, for the patent is silent in respect not only to the function itself, but as to the proper tension of the wires in order to obtain it beneficially."

(p. 68): "If this capacity for side movement be a beneficial function plainly inherent in Grant's combination and

arrangement of old parts in relation to each other and not a mere 'obscure property lurking in some accidental corner of his device,' it was not essential that the patentee should point it out as one of the advantages of his structure. This is because he has invented a machine, structure, or manufacture which includes in its necessary mode of operation the function in question, and whether the inventor knew or not the full measure of the beneficial functions of his structure, he is entitled to all the uses of his invention. *Goshen Sweeper Co. vs. Bissell Carpet Sweeper Co.*, 19 C. C. A., 13–20; 72 Fed., 67; *Dowagiac Mfg. Co. vs. Superior Drill Co.*, 115 Fed., 886; *Wells vs. Curtis*, 13 C. C. A., 494–498; 66 Fed., 318.

(p. 69): *If this tipping capacity had been pointed out, and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved, though this we need not consider.* But neither the advantage of such a function nor any hint that it is in any wise dependent upon the normal tension of the retaining wires, is to be found in the patent."

The foregoing quotations from the opinion of the Circuit Court of Appeals for the Sixth Circuit show that its decision was predicated upon the proposition that in the record then before it, it was not proved that the lateral tipping function of the tire, which was a new function, resulted necessarily and inevitably from the use of Grant's device as described in his specification and shown in the drawings of his patent; *but that if it had been so proved Grant would have been entitled to the benefits of this function to the same effect as if it had been set forth in the specification of his patent,* for the statute does not require that a patentee should set forth the advantages of his device, simply that he shall describe its construction and mode of application in such a manner that others skilled in the art will be enabled to put it into use.

In the suit of these complainants against the Firestone Tire & Rubber Co., wherein the patent was sustained at circuit by his Honor, Judge PLATT, whose decision was affirmed by the Circuit Court of Appeals for the Second Circuit (the opinion of that Court of Appeals being printed on page 39 of the petition herein), it was made fully to appear *that the function of the Grant tire above described results necessarily from the use of*

the device when made and applied as stated in the specification, that it is not dependent upon the degree of tightness of the wire rings by which the tire is held in place, but that if any ordinary mechanic should apply the Grant tire to a wheel drawing the wire rings sufficiently tight for the purpose of holding the rubber in the channel, the tire will tip and reseat itself in the manner which we have explained ; *and that this will happen no matter how tightly the wire rings be drawn, even though they are drawn as tightly as possible short of breaking.* This was clearly demonstrated by the tests, shown in the photographs both in the Finston case and the one at bar, the latter of which were reported in open Court on the trial in the Circuit Court of Appeals.

The Court of Appeals of the Second Circuit, therefore, held that the facts proved in this record are substantially different from the facts shown in the record in the Goodyear case ; that the proofs now demonstrate that the Grant tire necessarily possesses a new function and mode of operation, and that the patent should be sustained ; they held further that if this proof had been before the Circuit Court of Appeals of the Sixth Circuit, there is no reason to doubt that the decision of that Court would have been favorable to the patent. The Court of Appeals for the Second Circuit said on this point (Petition, pp. 40–42) :

> " The Circuit Court of Appeals found that the new mode of operation which produces this result is not mentioned in the specification or inherent in the combination but depends for its discovery upon the ingenuity of experts. Recognizing the rule that one who has invented a structure which cannot be used without including the function which produces the new result, is entitled to all the uses of his invention whether known to him or not, the court says :
>
> > " If this tipping capacity had been pointed out and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved.'
>
> " It now appears that the feature which secures patentability is inherent in the patent, and the specification is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature is neither an accident nor ' an obscure

property'; it exists in every wheel on which is mounted a tire which follows the teaching of the patent. In view of this new aspect of the case we have no reason to doubt that on the present record the Court of Appeals of the Sixth Circuit would reach a result favorable to the patent.

The complainants' expert says:

'It is absolutely impossible to adjust the tension of the wires, so that this yielding capacity will not be exhibited in the tire.'

We are convinced, in view of the new testimony, that he is correct. The specification is addressed to those skilled in the art; it is enough that they understand it. Had the patentee attempted to point out the minute details of the elements making up his combination—such as the quality and degree of elasticity of the rubber, the material, size, strength and tensility of the wires and the exact amount of force needed to draw the wires together, he would have found himself surrounded by difficulties even more serious than those which now confront him. He chose to leave these details to the intelligent operator with the assurance that such a one would possess sufficient knowledge to draw the wires tight enough to hold the rubber firmly in the channel, but not tight enough to break them. Nothing more was required, for a tire so secured would necessarily have the capacity of reseating itself when subjected to unusual lateral strain and would infringe the claims. The entire prior art was before the skilled workman to the same extent as if written in the Grant patent, and, with this knowledge, it is hardly possible that he could set the tire so that it would fail to perform the functions referred to, unless he deliberately purposed to make a failure. On the one hand, he would know that he must not draw the wires tight enough to break them, and, on the other, that he must draw them sufficiently to hold the tire snugly in the channel. Ordinary common sense would teach him to do this, and if he neglected to exercise it he would find that in one case the wires would break and in the other that the tire would rock, and, if subjected to any unusual jolt, would roll out of the channel. That the capacity for readjusting itself when subjected to lateral strain is inherent in the Grant tire seems perfectly plain, and was demonstrated at the argument even by hand

pressure applied to the tire at a point where the rubber had been cut down so as to expose the wires. Indeed, the defendant's expert says :

" 'There is no doubt that when lateral pressure is applied to one side of the exposed portion of the tire, there is a tendency to roll the tire out of the channel. The element which materially resists this tendency is that retaining-wire on the side to which the pressure is applied. If this wire is sufficient to resist the strain, the tire cannot roll out of the channel; and the function of the other retaining-wire, at the opposite side of the tire, is simply to hold that part of the tire in its place, in order that it may be prepared, in its turn, to receive lateral thrust from the opposite side.'

" Without discussing the subject further we are satisfied that the description of the patent is sufficiently full, clear, concise and exact to enable a person skilled in the art to make the Grant tire. We are also convinced that the new and useful tipping and reseating feature is inherent in the structure, and that it was not necessary to point it out specifically, for the reason that no intelligent mechanic in the rubber-tire art could follow the teachings of the patent without producing a tire possessing this function."

No Conflict of Opinion.

There is no *conflict of opinion* between the decisions of the Circuit Court of Appeals for the Sixth Circuit and the Circuit Court of Appeals for the Second Circuit, but merely a difference of conclusion based upon substantially different proofs; and a writ of *certiorari* should not be granted for the mere purpose of ascertaining whether the Court of Appeals for the Second Circuit was justified in finding from the evidence that in the present record the tipping and reseating function of the tire have been fully proved to exist. *This is a question of fact, not a question of law,* and the fact as proved by the record in the case at bar has been found affirmatively by the Circuit Court and the Circuit Court of Appeals.

The portion of the petition, contained mainly on pages 19 to 29, in which it is sought to review the findings of fact of the Circuit Court and the Circuit Court of Appeals contributes nothing to the

petitioner's contention. In the case at bar the existence of the tipping function of the Grant tire under all conditions of its use and application has been proved by actual tests performed upon wheels of vehicles equipped with rubber tires and running under conditions of service, and by further tests performed upon the wheels after they had been removed from the vehicles; and some of these tests which had been described in the testimony and performed during the taking of testimony in the presence of defendant's counsel were repeated in the presence of the Court, demonstrating to the entire satisfaction of the Court that the tipping and reseating function of the Grant tire exists as a matter of fact, and that its existence explains the durability and usefulness of the Grant device.

The petitioner asks that the case be taken by this Court for the purpose of reviewing the testimony on this point, but we do not understand that it is the practice to grant writs of *certiorari* for the purpose of reviewing issues of fact, and we submit that on principle the findings of the Circuit Court and the Circuit Court of Appeals on questions of fact should be accepted as conclusive.

Kessler vs. Eldred.

A suggestion is made in the petition that this Court should take cognizance of this case because it involves in some way the principle of law stated in *Kessler vs. Eldred*, 206 U. S., 285; but the record shows no justification for this. In *Kessler vs. Eldred* this Court held that where a suit brought against a manufacturer of an article for infringement of a patent resulted in a final decree dismissing the bill and adjudging that the defendant's device did not infringe, the manufacturer could subsequently maintain a bill in equity to enjoin the owner of the patent from suing as infringers purchasers of the device made by such manufacturer, the defendant in the original suit. The decree in the case at bar was carefully limited by the mandate of the Circuit of Appeals for the Second Circuit so as to insure to the defendant petitioner all rights to which it may be entitled by virtue of *Kessler vs. Eldred*. The Court of Appeals ordered in the mandate, that the injunction should be limited so that it would not restrain the defendant petitioner from handling, using or selling rubber tires made by the defendants in the suits in the Sixth Circuit, wherein the patent had been held to be invalid. There is therefore no question under *Kessler vs. Eldred* which can arise in the case at bar.

The suggestion of the petitioner that the decree should be further limited so as to allow the defendant to make, sell and use all rubber tires manufactured in the Sixth Circuit, irrespective of the persons by whom they are manufactured, is so foreign to anything decided in *Kessler vs. Eldred* or which can be deduced as a matter of principle from the decision in that case that it can have no possible bearing upon the case at bar.

Decrees of courts of equity are not limited territorially. A decree of a Circuit Court in the Sixth Judicial Circuit in a suit for infringement of a patent, being a decre *in personam*, has no limitation to the states of which the Sixth Judicial Circuit is composed. The decree is binding upon the parties to the decree and upon persons who are in privity with the parties, no matter where they may reside, and it is not binding upon or enforceable on any other persons who have no relation to the parties to such decree. It is not contended in the petition that the Diamond Rubber Company, the petitioner herein, has any relation of business or privity with the Goodyear Company or with any other company previously sued under the Grant patent.

The litigation in which the patent has been involved has been long continued, and the patent has been uniformly sustained except in the Goodyear case in the Sixth Circuit and in the other cases wherein the record was the same as in the Goodyear case ; and in all these cases the patent was held to be invalid merely because the record therein did not establish by adequate proof the propositions of fact necessary to be established in order that the patent might be sustained.

Prior Litigation.

The following is a brief statement of the prior litigation :

The patent has been sustained in suits against the :—

Columbia Co., Southern District of New York, THOMAS, J., 91 Fed., 978.

Goodyear Co., Northern District Ohio, WING, J., not reported.

Finley Co., District of Georgia, NEWMAN, J., 116 Fed., 629.

Firestone Co., Southern District of New York, PLATT, J. 147 Fed., 739.

Firestone Co., 2nd Circuit, C. C. A., COXE, J., 151 Fed., 237.

Diamond Co., 2nd Circuit, C. C. A., LACOMBE, J., 157 Fed., 677.

Diamond Co., Southern District of New York, HOLT, J., not reported.

Diamond Co., 2nd Circuit, C. C. A., COXE, J., 162 Fed., 892.

Loubiere, Court of Appeals, Paris, France, November, 1901.

Incidentally it was held valid in a suit to collect royalties thereunder against Milwaukee Co. in the Circuit Court for the

District of Wisconsin, SANBORNE, J., 142 Fed., 531, and in the same case on appeal to the Circuit Court of Appeals of the Seventh Circuit, BAKER, J., 154 Fed., 353.

This patent was held invalid.

On appeal of the Goodyear case above mentioned, by the Circuit Court of Appeals of the Sixth Circuit, LURTON, J., 116 Fed., 363; in the Victor case in the same Circuit, LURTON, J., 123 Fed., 85, following the Goodyear case on practically the same record; and in the Kokomo case in the Circuit Court for the District of Indiana, ANDERSON, J., following the Goodyear case, not reported except on appeal, where the case was dismissed on complainants' motion, 127 Fed., 1018.

An application to the Supreme Court by respondent herein for writ of *certiorari* in the Goodyear case above mentioned was denied, 187 U. S., 641.

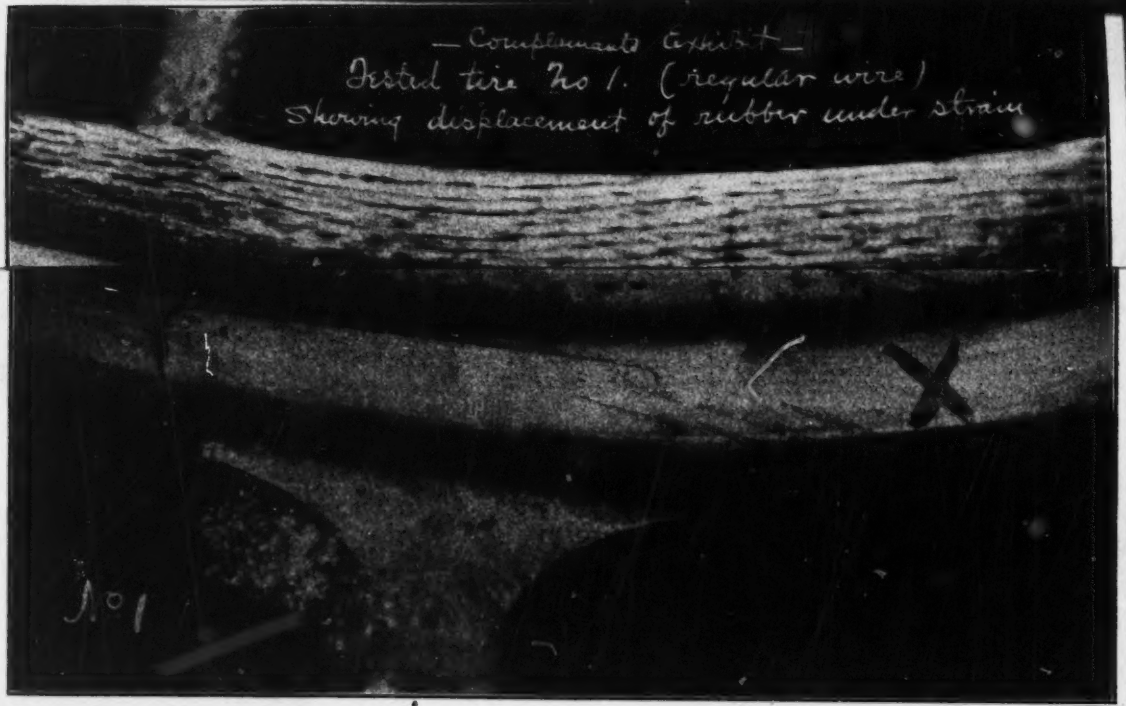
This practically amounts to *eleven* separate considerations and *eleven* opinions by *ten* different judges in favor of the patent, and *two* considerations by *one* judge against the patent, as, in the Kokomo case the record being the same on the tipping movement, Judge ANDERSON, as a matter of course, follows the decision of the Sixth Circuit Court of Appeals which then stood unchallenged.

We submit in conclusion that the petition for writ of *certiorari* should be dismissed, and that the respondent should be permitted to enjoy without further delay the benefits of its patent.

Reproductions of the tests made in this case in the presence of counsel for defendant showing the tipping capacity and repeated in open court on the trial in the Circuit Court of Appeals are appended.

CHAS. W. STAPLETON,
Solicitor for Respondent.

STALEY & BOWMAN,
THOS. W. BAKEWELL,
FREDERICK P. FISH,
Of Counsel.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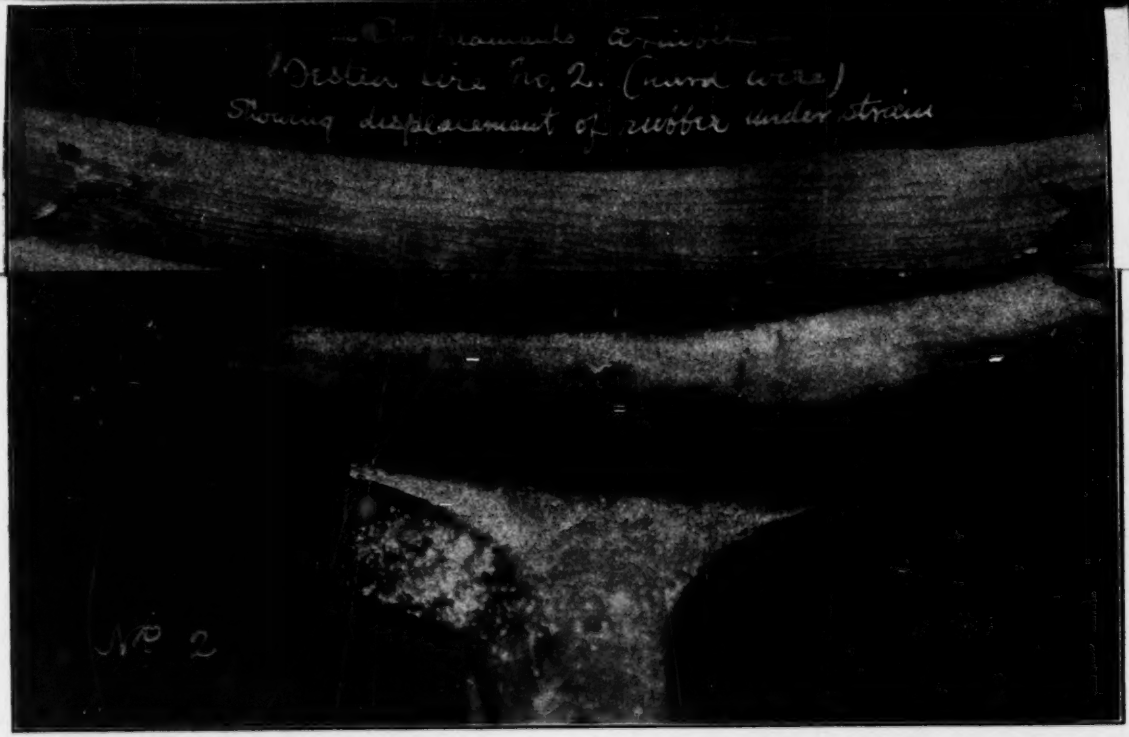
Tested tire No 1. (regular wire)
Showing displacement of rubber under strain
X
1.01


Bessler wire No. 2. (Cuivre wire)
Showing displacement of rubber under strain
No 2

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, A. D. 1908.

DIAMOND RUBBER COMPANY OF NEW YORK,
Petitioner,
vs.
CONSOLIDATED RUBBER TIRE COMPANY and RUBBER TIRE WHEEL COMPANY,
Respondents.

In Equity. No. 477.

Petition for Writ of Certiorari to the United States Circuit Court of Appeals for the Second Circuit.

MOTION.

And now comes the said petitioner, Diamond Rubber Company of New York, by Charles K. Offield, its solicitor and counsel, and moves the court that certain printed records present in the courts below as physical exhibits and there known and identified as the "Goodyear Record," "Firestone Record" and "Kokomo Record," be sent to this court as physical exhibits, and that the clerk of the United States Circuit Court of Appeals for the Second Circuit be so ordered to do, such motion being based upon the certified copy of the record filed herein and the petition for writ of certiorari accompanying the same, and particularly upon that portion of the opinion of the Court of Appeals of the Second Circuit passing upon the petition for rehearing of this cause by your petitioner, Record, p. 694, reading as follows:

> "The request that we direct that the printed records in the Goodyear, Kokomo and Firestone cases be sent to the Supreme Court as physical exhibits is denied. Although we see no objections to this course being taken, we do not feel at liberty to direct it, as it is for the Supreme Court to determine whether changes in the records shall be made. The application should therefore be made to that court or a justice thereof."

CHARLES K. OFFIELD,
Solicitor and Counsel for Petitioner.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1908.

Diamond Rubber Company of New York,
Petitioner,

vs.

Consolidated Rubber Tire Company and Rubber Tire Wheel Company,
Respondents.

IN EQUITY. No. 477.

Petition for Writ of Certiorari to the U. S. Circuit Court of Appeals for the Second Circuit.

ORDER.

Upon motion of Mr. Charles K. Offield, counsel for petitioner, it is hereby

ORDERED that the printed records present as physical exhibits in the courts below in this case and marked and known as the "Firestone Record," "Goodyear Record" and "Kokomo Record," be sent to this court as physical exhibits to be considered, if relevant, upon the presentation and consideration of the petition for writ of certiorari here pending; and the clerk of the United States Circuit Court of Appeals for the Second Circuit is so ordered to do.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1909.

No. [redacted]36.

DIAMOND RUBBER COMPANY OF NEW YORK,
PETITIONER,

vs.

CONSOLIDATED RUBBER TIRE COMPANY ET AL.

EXTRACTS FROM DEFENDANTS' EXHIBIT APPEAL RECORD, GOODYEAR CASE.

(21,273.)

(21,273.)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1909.

No. 209.

DIAMOND RUBBER COMPANY OF NEW YORK, PETITIONER,

vs.

CONSOLIDATED RUBBER TIRE COMPANY ET AL.

EXTRACTS FROM DEFENDANTS' EXHIBIT APPEAL RECORD, GOODYEAR CASE.

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., NOVEMBER 20, 1909.

* * * * * * *

And thereupon BERTRAM G. WORK, a witness produced on behalf of complainants, being first duly sworn, testifies as follows in answer to interrogatories proposed by Mr. BOWMAN:

Q. 1. Please state your name, age, residence and occupation?
A. Bertram G. Work; age 33 years; residence Akron, Ohio; occupation, superintendent of the B. F. Goodrich Company.
Q. 2. How long have you held that position?
A. About ten years.
Q. 3. Please state whether or not your company has furnished The Rubber Tire Wheel Company rubber for their solid rubber tires, and if you have furnished them rubber, please give approximately the amount, as to the number of tires up to the present time?
A. We have furnished the Consolidated Rubber Tire Company, and its predecessor, The Rubber Tire Wheel Company, with tires since they commenced business. I should say we have furnished them altogether between 400,000 and 425,000 tires.
Q. 4. In this case the complainants' witnesses who have testified as to the success of the Kelly or Grant tire, have been cross-examined as to the quality of rubber and have been asked as to improvements in the rubber furnished The Rubber Tire Wheel Company and by that company furnished to the public for vehicle wheels. Will you please explain as to what your experience has been as to this matter of rubber as furnished The Rubber Tire Wheel Company?

Objected to by defendants' counsel unless the witness' answer will cover the matter as to the wearing qualities from knowledge obtained from its actual use by the users of rubber tires generally since their first adoption, or rather, since witness' company's first sale of rubber for wheels.

Complainants' counsel calls the Court's attention to the fact that the witnesses who have testified on behalf of complainants as to the remarkable success of the Kelly tire were practical carriage men generally who did not pretend to know as to the quality of the rubber or to be versed in any way in that art, but said witnesses, against the complainants' objections, were cross-examined as to mere matters of opinion on the quality and alleged improvements in rubber, and counsel insists that this witness, on account of his experience, is qualified to give an opinion, as well as the facts, as to those matters attempted to be proved by defendants.

Counsel for defendants begs leave to state that the witnesses referred to testified from knowledge acquired from the actual use of rubber tires as to the wearing qualities of rubber now used as compared with the rubber used by them earlier in their experience with rubber tired wheels, and they therefore, had that practical knowledge to which greater weight naturally attaches than could be secured from one who may have some particular knowledge as to the ingredients of the compound as recognized at the factory.

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A. Since we commenced to manufacture tires for The Rubber Tire Wheel Company we have had returned to us a large proportion of the old and worn-out tires after they have been taken out of service. In addition to this, I have made it my business to keep in touch with the trade and have been constantly posted in regard to the wearing qualities of the different compounds. Since beginning the manufacture of the tires we have made them of four different compounds. The object of each change was to produce greater economy. The compounds have all given satisfaction, but some gave longer service than others. So far as the fastening device was concerned, however, the compounds have been practically equal. In other words, the success of the fastenings is not dependent upon the compound, but naturally one compound would give better wearing service than another.

Q. 5. Would you say, then, that there has been any marked improvement or changes in the manufacture of rubber for rubber tires since you first commenced to furnish The Rubber Tire Wheel Company?

A. No, there has not.

Q. 6. Do you remember when you testified in the Victor case that you examined some pieces of old tire marked "Complainants' Exhibit, Erter's Old Tire," and if so, will you please state what you remember to have found to be the compound used in those old tires?

A. I remember of examining such a tire and believe the compound was our "I. J."

Q. 7. In this case, the defendants have endeavored to show that the failure of the tires known as *to* the Dubois, Emerson, and English or Clincher tires was due to the rubber and not to the mechanical means used in holding those tires to the wheels. Will you please state whether or not you or your company ever furnished Dubois, Emerson and the parties applying the English or Clincher tire with rubber, and if so, what your experience was?

Objected to by defendants' counsel as not properly and fully stating the position of the defendants with reference to the earlier tires used in the trade.

A. We did furnish Dubois and Emerson with tires and made them of the same compound that we later furnished to The Rubber Tire Wheel Company. The tires as applied by Dubois and Emerson were not a success. Tires made from the same compound, however, and applied by The Rubber Tire Wheel Company were a success. We also — the English or Clincher tire to Brewster and Kimball. These tires were successful in a way, but were discarded by Brewster and Kimball for The Rubber Tire Wheel Company's tires.

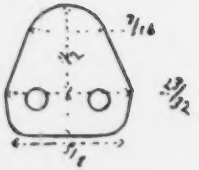
The latter part of the answer is objected to as based on hearsay. Complainant refers the Court to the testimony of Mr. Kimball and Mr. Brewster on this point.

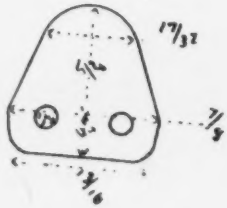
Defendants' counsel: As to the testimony of the witnesses referred to, counsel for defendants begs leave he is not now entering an objection.

Q. 8. Do you remember what year it was that you began furnish

"Complainant's Exhibit, April, '94 Drawing of Grant Tire."

Chas I. Welch
N. P.





C. I. W.
N. B.

ing Dubois with rubber and when it was that you began furnishing Emerson with rubber?

A. We began furnishing Dubois with rubber in 1892 and Emerson in 1892 or 1893.

Q. 9. Do you remember as to whether or not your company furnished Mr. James Rodgers of the Tricycle Company of Springfield, Ohio, with rubber and what your experience was as to his tire?

Objected to as immaterial and not proper in rebuttal.

A. We did furnish Mr. James Rodgers with considerable rubber for tires made of different compounds, and our experience was that his tire was not a success.

Q. 10. Do you remember whether or not you tried any of the same compounds that you furnished to The Rubber Tire Wheel Company?

A. Yes, some of them were the same.

Q. 11. Do you remember as to the Emerson rubber tire, as to what patent he made his rubber tires under, and as to the manner of holding the rubber on the wheels?

A. He made them under the Elliott patent. The method of fastening was a steel tape passed through a slot in the tire and encircling the wheel.

Q. 12. I now hand you "Complainants' Exhibit, Sample of Kelly Tire," and ask you to state how this sample compares with or differs from the tire which The Rubber Tire Wheel Company put upon the market as heretofore explained by you.

A. It seems to be identical.

Q. 13. Do you remember when you first received orders for rubber for this particular tire and when you first filled orders for such rubber?

A. This sample is made in a mold. We first received orders for molded tires in April and shipped the first tires in May, 1894.

Q. 14. Do you remember as to the manner in which you obtained the correct shape for this particular rubber tire? I mean by that, who furnished the necessary data for that purpose?

A. The Rubber Tire Wheel Company furnished us with a drawing showing the shape and size.

Q. 15. Do you remember that that drawing was produced by you when you testified in the Victor case?

A. Yes, it was.

Counsel for complainants states that that drawing was introduced in the Victor case and marked "Complainants' Exhibit, April '94, Drawing of Grant's Tire," and that said exhibit is now in possession of Judge Thompson. Complainants offer in evidence said exhibit and the same will be marked as in the Victor case.

(Here follows diagram marked p. 5*a*.)

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The title given this exhibit is objected to by defendants' counsel on the ground that it attempts to state a fact not yet proved.

Q. 16. Do you remember the date when the molds for this tire were finished and explain how you fix the date as to the receipt of the drawings, the finishing of the molds and the shipment of the first rubber for that particular kind of tire?

A. The molds were ordered April 15, 1894; the molded tires were shipped the middle of May, 1894; the drawings for the molds were received April 22, 1894. I determine these dates from our factory records.

The answer is objected to as being secondary evidence, the records themselves being the best evidence on the subject-matter.

Q. 17. Mr. Edward Emerson, in testifying as to his experience with the rubber tire, like the sample marked "Complainants' Exhibit, Caffrey's Piece of Elliott Rubber," stated that in the summer of 1893 Mr. Grant and Mr. Work appeared on the scene with samples of his form of rubber tire with two holes instead of the tape, and that the same were found by him at Ferdinand F. French's. Please explain whether you are the Mr. Work referred to and whether the statement was true.

A. I am undoubtedly the Mr. Work referred to. Regarding the rest of the statement I presume he must have meant that Mr. Grant was the inventor and I was the manufacturer.

Q. 18. Do you remember as to the Ferdinand F. French Company using the Elliott tire and what was the result of their experience with it?

A. They did use it, but had so much trouble they were obliged to abandon it.

Objected to as being clearly secondary evidence.

Q. 19. Do you remember as to the letter produced by you when you testified in the Victor case, which letter was dated April 5, 1894, addressed to E. S. Kelly, and read as follows:

"COMPLAINANTS' EXHIBIT. Goodrich Company's Letter of April 5, 1894."

"AKRON, OHIO, *April* 5, 1894.

"E. S. Kelly, care The Rubber Tire Wheel Co., Springfield, Ohio.

"DEAR SIR: Your favor of the 2d received. In reply would say that the prices we gave you for rubber tires, namely, 50 and 60 cents per pound, are as low as we can go for the quality, and we feel certain that no other firm can underbid us in this direction. Some parties may claim that they can give you a better grade than we offer, but the test of service will prove whether or not their goods are superior. We would much prefer to sell you our 'F' compound as we have furnished it to several of our customers for some time, and as far as our experience goes it has given the best satisfaction. We have done a great deal of experimenting in order to get up a compound that will last a reasonable length of time for this

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service and believe what we offer you will be found all right. We beg to state that the quotation submitted on the molds was only estimated and after doing the work we may find that it costs us somewhat less than we anticipate. In that case we will gladly credit you back with the amount, as we only figure on charging you what we pay out for labor and material. We expect to make no profit. We feel reasonably certain that you will consider this a fair proposition. We note that you intend to receive bids from several manufacturers, but we sincerely hope that you will decide to continue with us. We are very anxious to handle your business and shall certainly exercise unusual care at all times to see that only perfect tires are sent you. We are very much interested in the matter and shall appreciate your kindness if you will let us hear from you further as soon as convenient.

"Very truly yours,

"THE B. F. GOODRICH CO.
"B."

Adjourned until 1:45 P. M., and met pursuant to adjournment.

A. Yes, I remember it.

Q. 20. Then I understand that was a letter written by your company to Mr. E. S. Kelly and forwarded to him through the mails?

A. Yes.

Q. 21. In that letter you refer to quotations submitted on molds. Please state whether or not that refers to the molds for the particular tire shown in "Complainants', Exhibit, Sample of Kelly Tire?"

A. It does.

Cross-examination by Mr. STEWART:

Not waiving any of the objections heretofore made, counsel proceeds to cross-examine.

X Q. 22. Did you have anything to do with this correspondence?

A. Yes. I either wrote or directed the writing of the letters to Mr. Kelly or The Rubber Tire Wheel Company.

X Q. 23. In seeking to get a rubber tire which would have the requisite toughness and strength and proper qualities for rubber tire purposes, you have made numerous experiments and made different compounds from time to time during your experience with this subject, have you not?

A. Yes.

X Q. 24. By what designation did you know the different compounds referred to by you as having been prepared at your factory, four in number, I believe?

A. "F", "417", "I. J.", and "417 special."

X Q. 25. You furnished Mr. Rodgers of Springfield, rubber tires from compound "417", did you not?

A. Yes.

X Q. 26. Mr. Rodgers was instrumental in bringing about the adoption of compound "417" by stating the qualities he wished to be incorported in his rubber which you were to furnish, was he not?

A. We made tires for Mr. Rodgers from a number of different compounds. He gave no specific instructions regarding the kind of a compound he wanted, but left it to us to furnish something suitable for the purpose. I therefore, cannot say that he was responsible for our having furnished him with No. 417.

X Q. 27. You testified in the case of The Rubber Tire Wheel Company against the Victor Rubber Tire Company et al., on or about March 17, 1899, did you not?

A. Yes.

X Q. 28. In answer to X Q. 38 of the record of your testimony in that case, on page 292, which I now hand you, in answer to the question as to whether or not Mr. Rodgers was instrumental in bringing about the adoption of compound No. 417, by stating the qualities he wished incorporated in his rubber, I find your answer to be as follows:

"A. I believe he was." What have you to say now with reference to the answer as given then to this question?.

A. I think my answer as I now give it is correct, although of course, in a general way, Mr. Rodgers was responsible for our having sent him 417 because in our opinion 417 was suitable for his purpose.

X Q. 29. Do I understand that you are not inclined now to adopt the answer as given by yourself in the Victor case with reference to Mr. Rodgers being instrumental in bringing about the adoption of No. 417 by stating the qualities he wished in his rubber?

A. No, I think my answer in this case is more specific and correct.

X Q. 30. When did you first furnish Mr. Rodgers with rubber tires from compound No. 417?

A. I cannot state definitely without reference to our records, but probably in 1893 or 1894.

X Q. 31. I observe in your answer to X Q. 34 in the Victor case, above referred to, you stated that while you could not be positive, but to the best of your recollection you would say it was sometime during 1893. I will ask you as to whether you are willing to adopt that as your answer now?

A. Yes.

X Q. 32. What compounds other than No. 417 had you furnished to Mr. Rodgers prior to the time when you sent him the latter?

A. 525 and F are the only two I can recall.

X Q. 33. How long before No. 417 was furnished did you furnish compounds 525 and F?

A. Mr. Rodgers did not confine himself to one compound at any time.

X Q. 34. Which compound did you send him first?

A. I cannot undertake to answer details of this kind, as too much time has elapsed.

X Q. 35. Is the rubber tire referred to as having been sold by Rodgers now on sale to your knowledge?

A. I believe it has been entirely abandoned.

X Q. 35. Do not the Whitman & Barnes Co. of Akron, put this tire upon the market at this time?

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A. They did, but if I am correctly informed, they lost so much money through it that they were obliged to abandon it and are now manufacturing another type.

X Q. 36. Do you know this to be true of your own knowledge?

A. I was told so by the man who is at present marketing the tires they are at present manufacturing.

X Q. 37. When was this statement made to you that you refer to?

A. About two months ago.

X Q. 38. This individual who gave you this information, do you know as to whether or not he had an interest in the tires that he claimed he now was marketing for the Whitman & Barnes people?

A. I believe he has.

X Q. 39. Have you had any conversation with any of the officers of the company or those having the business of the company regularly in charge with reference to whether or not they have abandoned this tire recently?

A. No.

X Q. 40. How long before this individual gave you this information above referred to was it that he claimed the Whitman & Barnes Co., had abandoned the sale of this tire?

A. He did not state.

X Q. 41. Other companies than your own furnish the complainants with rubber tires, do they not?

A. Yes.

X Q. 42. Do you furnish any rubber tires for Morgan & Wright?

A. No.

X Q. 43. Do you know who does?

A. They make their own.

X Q. 44. I believe you stated, in answer to Q. 4. that since the beginning you manufactured tires from four different compounds, and, as I understand from your answer to X Q. 24, they are known by the following characters and numbers, respectively, "F," "417," "I. J.," and "417 special." Am I correct?

A. Yes.

X Q. 45. In your answer to X Q. 32, you say you furnished Mr. Rodgers, in addition to compound No. 417, compounds 525 and F. Do I understand that No. 525 is identical with one of the four compounds you have spoken of or whether it is independent of same?

A. It is a different compound from any of the four mentioned.

X Q. 46. How do you explain this answer with your answer to Q. 4, where you claim that you had to do only with four different compounds?

A. Q. 4 referred to the compounds we have furnished to plaintiff.

X Q. 47. How many different compounds have you made for rubber tired wheels?

A. I am unable to state definitely, but probably we have tried a dozen at different times.

X Q. 48. So that you have been keeping up a series of experiments in this direction, have you not?

A. Yes.

X Q. 49. Naturally always trying to get something better?

A. Not so much to get something better as to get something just as good which will not cost as much.

X Q. 50. Is it not true that in the manufacture of rubber compounds a slight variation in the ingredients, or the proportions of the same ingredients, or in the manner of compounding them, and a slight variation in the vulcanization and in the temperature of the heat employed, will each and all produce a product which will vary more or less in its quality?

A. Yes.

X Q. 51. Is the difference between compounds "F" and "417" made by a difference in temperature and time, or a change in proportions and ingredients?

A. "F" and "417" are different compounds due to different ingredients used.

X Q. 52. Is your company a competitor of the Goodyear Tire & Rubber Co., defendant?

A. Yes.

X Q. 53. What compound does the complainant use now?

A. "417 special."

X Q. 54. When did they commence using that compound?

A. I believe it was eight or ten months ago.

X Q. 55. What compound had they been using just prior to the adoption of "417 special."

A. "I. J."

X Q. 56. How long did you furnish that compound to complainant?

A. Something over a year, I believe.

X Q. 57. What compound did you use prior to that?

A. "176" which is practically the same as "417 special."

X Q. 58. For how long a period of time did you use "176"?

A. I believe it was about six months.

X Q. 59. What compound prior to "176" did you furnish?

A. "417."

X Q. 60. State, what if any other compounds besides those mentioned you furnished complainant?

A. Prior to "417" we furnished "F" which, is quite similar to "I. J." and I believe that completes the list.

X Q. 61. Were these different kinds of compounds furnished exclusively during the period they were sent to complainants?

A. Yes. Soon after we commenced supplying The Rubber Tire Wheel Company with their tires, we agreed not to supply any one else with solid tires for vehicles.

X Q. 62. Did you not receive a special consideration for this agreement to sell exclusively to complainants?

A. No consideration except the good-will and trade of The Rubber Tire Wheel Company.

X Q. 63. Were you not furnished or given stock in The Rubber Tire Wheel Company in consideration for the special services that you were to give in connection with providing the very best quality of rubber obtainable?

A. No. I bought and paid at par value for some stock at the time

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The Rubber Tire Wheel Company was incorporated, but this was a personal matter and had nothing whatever to do with the relations between the B. F. Goodrich Company, and The Rubber Tire Wheel Company.

X Q. 64. How long did you retain this stock?

Objected to as immaterial and as improper cross-examination.

A. Until The Rubber Tire Wheel Company sold out to the Consolidated Rubber Tire Company.

X Q. 65. Did you furnish any rubber compound for rubber tired wheels to persons other than complainants subsequent to April or May, 1894?

A. We may have for a short time, as I do not remember the date that we agreed not to manufacture for anybody else.

X Q. 66. It was before you furnished the complainants with rubber that you commenced to furnish Mr. Rodgers with rubber tire, as I understand. Am I correct?

A. Yes.

X Q. 67. Please state to about what extent you furnished Rodgers with rubber tires in 1893?

A. He bought tires frequently, but only in small lots.

X Q. 68. As I understand, you furnish rubber now to complainant?

A. We do.

Redirect examination by Mr. BOWMAN:

Re-D. Q. 69. In the Victor case you were cross-examined as to the kind of a tire sold by James G. Rodgers, and you were handed letters-patent No. 539,826, dated May 20, 1895, and asked whether that was the tire manufactured by you for him in 1893, and you stated that it was not; that in the patent the cushion was adapted to be fastened with wires, whereas in the tires you furnished him the cushions were cemented in the rims. Is that correct?

Objected to by defendants' counsel as improper redirect.

A. Yes.

Complainants' counsel states that the letter referred to in answer to Q. 19, is also in the hands of Judge Thompson, but same is offered in evidence and will be marked in this case "Complainants' Exhibit, Goodrich Company's Letter of April 5, 1894."

Recross-examination by Mr. STEWART:

Re-X Q. 70. In the tires furnished to Mr. Rodgers, there was only one hole, was there not?

A. Yes.

Re-X Q. 71. This hole in the tire was for a wire, of course, as I understand it?

A. It was for the combined purpose of a wire and to create more cushioning effect in the tire.

Re-X Q. 72. Do you know whether the Rodgers tire as manufactured by Whitman & Barnes Co. contained one wire also?

A. I do not.

BERTRAM G. WORK.

* * * * * * *

And thereupon E. S. KELLY, a witness produced on behalf of complainant, being first duly sworn, testifies as follows in answer to interrogatories proposed by Mr. Bowman:

Q. 1. Please state your name, age, residence and occupation?

A. E. S. Kelly; 43; New York City; rubber tire business.

Q. 2. With whom are you engaged in the rubber tire business and in what capacity?

A. Manager of The Rubber Tire Wheel Company and of the Consolidated Rubber Tire Company.

Q. 3. How long have you been engaged in the rubber tire business?

A. About six years and a half.

Q. 4. Please explain as to your official connection with The Rubber Tire Wheel Company when the business was first begun, and state under what patent you have made rubber tires for vehicles?

A. I was President of The Rubber Tire Wheel Company which was begun in the spring of '94, and we sold a tire under the Grant patent.

Q. 5. Please explain as to the history of the business done in the manufacture and sale of rubber tires under the Grant patent, stating how rapidly the business increased and stating approximately the volume of business and number of tires sold during a year at this present time.

A. When we began the business in '94, there were very few tires on the market and the first year we sold about six hundred sets or twenty-four hundred tires. In '95 we sold 20,000 tires, and in the year ending July 1, 1900, we sold about 300,000 tires. The gross sales for the last-named year were about $1,500,000.

Q. 6. I hand you a written instrument which purports to be an assignment from Arthur W. Grant, of an invention on rubber tired wheels, which instrument refers to an application for letters-patent executed on the 7th day of November, 1895, and ask you to state whether you can identify same?

A. Yes, sir; I can identify it. This is an assignment of an application for patent issued to The Rubber Tire Wheel Company, and I recognize both his signature and that of Mr. Hoffman.

The defendants object to Q. 5 and the answer thereto on the ground that the same is wholly incompetent in rebuttal, as the matter stated, if true, belongs to the prima facie case of the complainants. This objection is entered once for all to such testimony.

Q. 7. Do I understand that this assignment conveyed to The Rubber Tire Wheel Company the title to what you have heretofore

POOR COPY

referred to as the Grant patent under which you manufactured rubber tires?

A. Yes, sir.

Q. 8. I now hand you an exhibit marked "Complainants' Exhibit Sample of Kelly Tire," and ask you to state how that compares with or differs from the rubber tire which you began manufacturing in the spring of 1894 under the Grant patent and as to the tire you have since manufactured?

A. This is a sample of the tire sold by The Rubber Tire Wheel Company under the Grant patent.

Defendants object to the question and answer and exhibit on the ground that the exhibit is incompetent or immaterial and irrelevant because it does not correspond with the structure of the Grant patent as shown by the deposition of the defendants' expert, Mr. See. This objection is entered once for all.

In answer thereto counsel for complainant suggests that the court itself can determine this by comparing the structure with the Grant patent, and particularly the claims thereof, which define the elements which are covered and protected by said patent.

Q. 9. I now hand you a written instrument which purports to be an assignment of letters-patent No. 554,675, which recites that the instrument in writing dated tne 7th day of November, 1895, was executed concurrently with the application for said letters-patent No. 554,675, and ask you whether you can identify that instrument as having been executed by Arthur W. Grant?

Objected to as incompetent in rebuttal. This objection is made once for all.

A. Yes, I recognize the instrument and signature as being that of Arthur W. Grant.

Q. 10. In the cross-examination of witnesses who testified on behalf of the complainant as to the success of the tire made under the Grant patent, there has been some attempt made on the part of the defendants to weaken the success of this tire on the ground that there are other devices, such as the Morgan & Wright, on the market, and I will ask you to explain as to the matter of competition and the effort of different people to market a tire which would not infringe and would give some success?

A. During the six years and a half in which I have been in the rubber tire business, there have been a number of tires put upon the market in competition with us, all of which have proven to be absolute failures except the two-wired tires. For instance, the New England Rubber Tire Company started in Boston about two years ago with what is known as a band tire and within the last year it has been abandoned entirely. The Morgan & Wright Co. commenced to putting on the market a little over a year ago what is known as the Morgan & Wright Band Tire, and today it is recognized as being an absolute failure.

The answer objected to as being secondary evidence and as merely a conclusion of the witness.

Counsel for complainants refers the Court to the testimony of the St. Louis, Chicago and Baltimore witnesses, who used and tried the tires referred to by Mr. Kelly.

Counsel for defendants, if an argument is to be presented at this time, will likewise call the attention of the Court to the fact that witnesses of complainant especially in Baltimore and New York, stated that these tires were now upon the market and were being sold.

Q. 11. Please explain as to the manner in which Morgan & Wright and the New England companies and other manufacturers of similar tires would endeavor to get some of the rubber tire business, explaining as to the matter of price?

Objection repeated.

A. As I have stated, the New England tire is no longer on the market, but it is true that the Morgan & Wright Co. did a *a* large business in rubber tires from the 1st of January, 1900, until the present time for the reason that they sold the tires for at least 20 per cent. less than our price and because the Morgan & Wright Co. are a rich concern and it would be natural to suppose that they would not put on the market a tire that was not a good one. This enabled them to do a large amount of business. Most of these tires have only been in use from three to six months and today they are recognized by the carriage men and especially those that sold them last year, as being an absolute failure, and today we do not consider them as any competition for future business.

Q. 12. You have referred in a previous answer to the two-wired tire. Please explain with reference to the exhibit "Complainants' Exhibit, Sample of Kelly Tire," as to the meaning of the term "two-wired" tire?

A. A two wired tire is one in which the rubber is held in a steel channel by two wires in the rubber.

Q. 13. How does the construction compare with or differ from the sample "Complainants' Exhibit, Sample of Kelly Tire?" I mean by that whether or not the term "two-wired" tire as known to the trade means a tire like the sample you have in your hand?

A. The sample referred to is a sample of two-wired tire.

Q. 14. Can you give the date when the tire as made under the Grant patent was first introduced onto the market?

A. The spring of '94.

Q. 15. Do you remember the month and can you tell the date by reference to any correspondence you had with the Goodrich Company?

A. I wrote them April 2, '94 to give us prices for a set of molds for making our tire and have in my possession a reply written April 6. The tires they made for us previous to that time having been made without molds.

Q. 16. I call your attention to a letter dated April 2, 1894, to B. F. Goodrich & Co., and ask you whether or not that is the letter referred to and how soon thereafter you introduced this tire onto the market?

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A. I recognize the latter and we began putting the tires onto the market within thirty or sixty days after that time.

Q. 17. I call your attention to letters from the B. F. Goodrich Company dated February 15, 1894, February 27, 1894, March 26, 1894, and March 29, 1894, which letters are in the possession of Judge Thompson, and will ask you to state whether you can remember that correspondence?

A. Yes, sir; I recognize this correspondence.

Complainants' counsel offers in evidence the letters referred to, to-wit, letters of the B. F. Goodrich Company dated February 15, 1894, February 27, 1894, March 26, 1894, and March 29, 1894, copy of letter dated April 2, 1894, and same will be marked "Complainants' Exhibit, Correspondence with Goodrich Company about Molds."

Complainants also offer in evidence the assignments referred to by the witness and same are marked "Complainants' Exhibit, Complainants' Title Papers Nos. 1 and 2."

The letters are objected to by defendants as having not been properly identified and all of the exhibits offered are objected to on the ground that the same are incompetent in rebuttal.

Q. 18. In this case the defendants have endeavored to show that the decision in the case of The Rubber Tire Wheel Company vs. The American Rubber Tire Company was obtained by collusion or fraud and have introduced some contracts or agreements between The Rubber Tire Wheel Company and the American Company. Will you please explain as to the litigation that was pending between The Rubber Tire Wheel Company and the American Rubber Tire Company, stating how The Rubber Tire Wheel Company came to agree to release the American Rubber Tire Company from damages for the infringement of the Grant patent and how after the decision was rendered the American Rubber Tire Company came to abandon the business of selling rubber tires and how your company came to buy the stock that they had on hand, together with their other assets?

A. In November, '98, after all of the testimony was in on both sides in the American case, it was evident that the American Company were going to be able to have the case put over for hearing until the spring term, and, feeling sure that the damages we would obtain against the American Company for past infringement would be hard to collect for the reason that it was a single liability company and Mr. Stapleton, their attorney and president, had said to me frequently that if we did get judgment against them, their stockholders and company would be under cover. Being very anxious to have the case come to trial and make a test case, we therefore made an arrangement with Mr. Stapleton to have the case heard as per what is called the November contract in which he was to waive all damages against us in a libel suit brought by them some time previous for $50,000, and we were to waive all damages against their company for past infringement and future damages for infringement until sixty days after decision was rendered. After the decision was rendered December 27, 1898, Mr. Stapleton imme-

diately commenced to order molds for making the rubber and rolls for making the steel of a new tire which he considered did not infringe the Grant patent and so advertised the same. About the latter part of February it was plain that we had secured the patronage of most of his customers. We were enabled to buy his business at what we considered a very reasonable price without anything at all for good-will. He showed us a statement of assets, $50,000, for which we paid $35,000. This was consummated about the 5th of February, I should have said that — the last of January instead of the last of February in referring to the patronage of the business.

Q. 19. Please explain as to whether or not the American Rubber Tire Company sold vehicle tires other than the solid rubber tire of the Grant patent?

A. Yes, in fact, a good per cent. of their business was in pneumatic tires and cushion tires for vehicles, a branch of the business we had never entered into, which required special machinery, all of which the American Company were well equipped and said branch of the business we desired to add onto our business, all of which we considered of considerable value to us in addition to the net assets.

Q. 20. In the contract of November 10, 1898, there is mentioned a release by the American Rubber Tire Company of all claims against The Rubber Tire Wheel Company by reason of an action for slander and libel. Will you please explain as to what that referred to and whether or not the suit was costing your company any money?

A. I don't remember the exact cause of this action but we always considered it a case of bluff and in fact the case was never pushed at all from the beginning and we had no fear of it ever being brought to issue and therefore it was costing us very little money.

Q. 21. Do you remember as to Mr. Stapleton's conduct after the case was submitted to Judge Thomas and before the decision was announced as indicating whether he regarded the case as settled by reason of your November contract?

Objected to as leading.

A. Mr. Stapleton was very anxious to have the matter settled before the decision was rendered, as he had been trying to do for two years. He tried to bluff me into a settlement in which he would be taken into the company as part owner, all of which I declined to do. For instance, about two weeks after the hearing he called me up by long distance telephone and said to me that he had information that was authentic that the Judge was sure to decide the case in their favor, which, in his opinion, would break down the patent, and it would be better if I would come to New York and have the attorneys take it out of the Judge's hands and settle the matter between us by letting him into the company. After calling up Mr. Staley by telephone at Columbus and Mr. Fish at New York, both of whom advised me that there was no truth in Mr. Stapleton's statement, I wired Mr. Stapleton that we would abide by the decision of the Judge. The following week Mr. Staley and myself were in New York and he showed me a letter from a friend of his who pretended to be a friend of Judge Thomas, and this letter stated that he had called on Judge Thomas and was led to believe from the conversa-

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tion that the Judge was then deciding the case, or rather, was writing his opinion, and that it would be decided in the American Company's favor, and only by the good advice of Mr. Fish and Mr. Staley I refused to have anything to do with any proposition whatever from Mr. Stapleton.

So much of the above answers that are immaterial, irrelevant and incompetent it is understood are objected to by counsel for defendants.

Adjourned until 2 P. M.

Met pursuant to adjournment.

Cross-examination by Mr. STEWART:

Counsel for defendants, not waiving any of the objections interposed to the questions put to the witness and the answers thereto, proceeds to cross-examine.

X Q. 22. Do you know of a publication published in New York called the "Hub", which circulates especially among the carriage people, a copy of which, the October number, 1900, I now hand you?

Question objected to by complainants' counsel as referring to a matter not touched upon in the direct examination and as relating to publications not properly identified, which objections by consent are made once for all.

A. Yes, sir.

X Q. 23. As I understand you, this publication circulates among the carriage trade?

A. Yes, sir.

X Q. 24. On page 25 of the October number which I presented to you I observe an advertisement of the Consolidated Rubber Tire Company, the following words appearing above the designs of rubber tires; "Kelly-Springfield Tire." Is this an advertisement of the tire you put upon the market under the Grant patent?

A. I acknowledge the advertisement as being one produced by our company showing a cut of the two- and four-wired tires, but I am unable to say, not being an expert, whether the four-wire tire is according to their patent or not. The two-wired tire shown in the cut certainly is. In way of explanation I should say that the four-wired tire shown in this cut is one designed for tires four inches wide and upward and is a success only on fire engine work or heavy horse-drawn vehicles, and we make no four-wired tires for any tire of a less size.

X Q. 25. On pages 16 and 17 of this October number appear advertisements of the Kokomo Rubber Company of Kokomo, Indiana, and the N. J. R. Spring & Rubber Co., of Chicago, Illinois, respectively. I will ask you whether or not the designs appearing thereon correctly represent the tires there advertised, if you know?

Objections to X Q. 22 repeated as to this matter, and counsel for complainants calls the Court's attention to this manner of cross-examination and to the defendants' effort to burden the record by

evidence as to alleged devices on the market and to their forme method of introducing evidence as to such tires as the Morgan Wright and New England, and that having found the proofs to sho that they were failures, they now attempt to introduce in an im proper way evidence as to still other devices.

A. So far as the Kokomo Rubber Company is concerned, it i a company that has been handling rubber tires but a short tim do a very small business, and while we have a suit against the for infringement, I have never seen their tire. As to the Wemak on page 17, this tire has been on the market but a very short tim and a very few of these tires having been sold. I have never seen i

X Q. 25. I will repeat X Q. 25, confining it, however, to the tire designated as the Calumet tire, appearing on page 19, of the Oc tober number?

Objections repeated.

A. This tire is what is known as the Band Tire, and has als been on the market but a very few months.

X Q. 26. I will ask you the same question as to the Morgan Wright tire appearing on page 23, of the October number, an the Batavia Rubber Tire Company tire, appearing on page 24?

Objections repeated.

A. The Morgan & Wright advertised on page 23 I recognize a the tire made by Morgan & Wright referred to by me as being th one that has proved to be an absolute failure. The Batavia tire o page 24 seems to look like the one that is advertised by the Batavi Carriage Wheel Company, which is also a very recent production.

X Q. 27. I will ask you as to whether the Batavia Carriage Whee Company is a different organization from the Batavia Rubber Tir Company?

Objections repeated, and further objected to as calling for sec ondary and hearsay evidence.

A. I want to correct my last answer by saying that the tire adver tised on page 24 I understand is being sold by the Batavia Rubbe Tire and not the Batavia Carriage Wheel Company. I understan that these two companies are different organizations.

X Q. 28. The question is repeated as to the tires appearing o page 28 and 29 of the same October number advertised by the Victo Rubber Company and the Victor Rubber Tire Company, respec tively.

Objections repeated, and counsel calls the Court's attention to the fact as shown in the Victor Company record that again the defend ants have shifted their position and after defending for more tha three years against the Grant patent, have recently claimed to hav changed their construction and that the alleged advertisement pur ports to represent this new device, but there has been no proof either in said Victor case or in this Goodyear case that said Victor Com pany ever sold such a device, but the proofs in the Victor ca

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show that the tire they did sell was different from the one now claimed to be advertised.

Counsel for defendants begs leave to state that representation of counsel is not correct for that the design appearing on page 29 advertised by the Victor Rubber Tire Company is the same as heretofore sold by said company, the same being patented as appears at the foot of the design on July 23, 1895, and that the design appearing on page 28 is being advertised by the Victor Rubber Company, a different organization.

Counsel for complainants suggests that the defendants' counsel point out where in defendants' record in this case there has been any proof of the precise tire that either the Victor Rubber Tire Company, or the Victor Rubber Company sells, and insists that the devices themselves and the proof relating to them are the best evidence, and that it is grossly unfair to burden complainants' record with recent advertisements as to what these two companies now claim after the Victor case has been argued that they now make and sell.

Counsel for defendants states that no evidence has been introduced heretofore as to either one of the tires appearing upon pages 28 and 29.

A. As to the advertisement of the Victor Rubber Company on page 28, this is the first advertisement I have ever seen of that company. I have always understood that the Victor Rubber Company made only rubber tires for the Victor Rubber Tire Company. The advertisement on page 29 is the same as other advertisements I have seen of this company's tire.

X Q. 29. You have known of a tire like the one appearing on page 28 being on the market heretofore, have you not?

Objections repeated.

A. No sir.

X Q. 30. I hand you a piece of rubber tire and the channel iron to which the rubber is attached, and will ask you how the same compares with the design appearing on the upper part of page 28, design designated thereon as the Victor Dovetail?

Question objected to on the ground that the advertisement and the device or alleged device are the best evidence of their construction, and counsel again protests against this line of cross-examination as to matters in no way touched upon in the direct examination.

A. It looks like the design.

Counsel for defendants offers the sample handed to the witness in evidence and asks that the Notary shall mark the same "Defendants' Exhibit, Victor Dove-tail Tire."

The offer of said exhibit is objected to by complainants' counsel on the grounds stated to X Q. 22 and subsequent cross-questions.

X Q. 31. The question is repeated as to tires advertised by the New York Belting & Packing Co., Ltd. on page 32, and the tire

advertised on page 33 in the October number by the India Rubber Company?

A. The cut shown on page 32 is advertised by the New York Belting & Packing Co., will say that this is the first advertisement I have ever seen of this company of a rubber tire of that kind. I will say that this is not a solid rubber tire at all, but a cushion tire which has proved to be a failure several years ago. I have never heard of any of these tires being sold on the market by this company. The advertisement by the India Company is the first one I have ever seen of this company and I have never heard of any tires being put on the market of this make.

X Q. 32. Question repeated as to the solid rubber tire, a design of which appears on page 66 of the same publication, advertised by the International Automobile and Vehicle Tire Company, of New York, with a Chicago branch.

Objections repeated.

A. The tires advertised on page 66 by the International Company, the one cut shows a pneumatic tire which does not come in competition with us at all, and another, which is a band tire practically the same as the Morgan & Wright, and this tire also has been on the market but a few months, and the third design on this page is known as a sectional tire which has been on the market for the past few years and is now practically abandoned and is no competition to us whatever. I might state further that the October number of the Hub is what is known as the convention number, being gotten out in advance for the carriagemen's convention, held the 15th of October, and a number of these advertisements do not appear in the regular number, as is the custom of all leading rubber tire concerns to have advertisements through the year.

Counsel for defendants offers in evidence the publication known as the "Hub" presented to the witness and asks the Notary to mark the same "Defendants' Exhibit, The Hub, October Number, 1900."

Objections to X Q. 22 repeated to said exhibit.

X Q. 33. I present to you a publication known as the Carriage Monthly, published by Ware Brothers of Philadelphia, being the August, 1900, number, and will ask you if you know of this publication, and if so, whether your company advertises in same?

Objections to X Q. 22 repeated to this question concerning said publication.

A. Yes, sir.

X Q. 34. This publication is also a well known one, is it not, and has a large circulation among vehicle dealers throughout the country?

Objections repeated.

A. Yes, sir.

X Q. 35. The designs on page 39 thereof correctly represent the tires sold by you, do they not?

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A. This is the same advertisement appearing in the Hub which was referred to before and answered by me.

X Q. 36. On page 13 of this publication appears a solid rubber tire advertisement by the Calumet Tire Rubber Company of Chicago, Ills.; on page 46 appears an advertisement of the International Automobile & Vehicle Tire Co., 346 Broadway, New York City; on page 47 a design of the solid rubber tire advertised by Morgan & Wright of Chicago; on page 55 several designs of solid rubber tires advertised by the Batavia Rubber Tire Company of Batavia, New York; on page 57 a design of a rubber tire advertised by Frederick K. Daggett. I will ask you as to whether these various designs correctly represent so far as you know the rubber tires advertised by these respective parties.

Objections to X Q. 22 repeated and it is further objected to as already answered in large part by the witness' previous answers, and counsel for complainants again protests against this unfair and improper cross-examination.

Counsel for defendants asks the witness to except from his answer the advertisement appearing on page 46 of the International Automobile and Vehicle Tire Company for the reason that no design appears in this advertisement.

A. Some of these advertisements I never heard of and others are the same as have been advertised before.

Counsel for defendants offers in evidence the number of the carriage monthly presented to and examined by the witness and requests the notary to mark the same "Defendants' Exhibit, Carriage Monthly, August, 1900."

Objections to X Q. 22 repeated to the offer in evidence of said exhibit.

X Q. 37. During the time you have had your solid rubber tire upon the market you have advertised extensively, have you not?

Objected to as immaterial, especially since the defendants themselves have shown that other companies who are unable to make a success of the rubber tire business have advertised very largely.

Counsel for defendants suggests that part of the comment of counsel for complainants is an assumption.

Counsel for complainants refers the court to the evidence as to the Morgan & Wright tire, largely introduced into this record by the defendants themselves.

A. While we have expended considerable money for advertising the proportion of money spent to the gross sales, it is probably less than any other company. The secret of our success has been that we have a successful rubber tire demanded by the public after a thorough test.

X Q. 38. Can you state about how much you have expended in advertising during the first two years and a half after placing the tire upon the market?

Objections repeated, and the Court's attention is again called to the record, which shows that the complainants' tire, aside from all

question of advertising, was put upon the market at the time of the Emerson tire, the Dubois and the English were in use and being pushed, and that said Grant tire has superseded all of them.

Counsel for defendants suggests that the record is not the proper place to make the argument.

A. I do not remember the amount.

X Q. 39. In answer to X Q. 12 on page 10 of your testimony in the case of The Rubber Tire Wheel Company vs. The Victor Rubber Tire Company et al., a copy of which record is here to be examined if desired, I observe you say that you could not answer the question very definitely without consulting your books, but that you would say that it was somewhere between $15,000 and $20,000 in two years and a half that your company had expended in advertising your business. Are you willing to adopt that as your answer at this time?

Objections repeated.

A. Yes, sir.

X Q. 40. Will you give an estimate of the number of illustrative and descriptive catalogues of your rubber tires which you sent out as advertising matter during that period?

A. I don't remember.

X Q. 41. In the Victor case, I observe that you stated that it was very hard for you to answer without consulting your books but that you would say about 100,000 in the two years and a half, large and small. Are you willing to adopt the answer given at that time, which I believe, as shown by the record, was probably some time during 1896?

A. Yes, sir.

X Q. 42. In answer to X Q. 15 in that record, which is as follows: "Compared with other concerns engaged in putting on rubber tires, has not your advertising been far greater than that of any other concern, so far as your information goes?" you replied "Yes". Are you willing to adopt that as your answer now to the same question?

A. In answer to that question, I will say that we did more advertising than any other concern, but we did proportionately a very much larger business.

X Q. 43. Mr. Arthur W. Grant, in his testimony in the said Victor case, stated that four or five per cent of your rubber tires would be cut by the channel iron and wires so as to make them unfit for use. Has your experience been such as to lead you to believe that his statement was correct in this connection?

A. I don't remember what our experience was at that time, but at the present time I know that it is almost unknown.

X Q. 44. Mr. Grant's testimony was taken in the Victor case in March of 1899. Are you prepared to state from your experience as to the correctness of his statement in that connection up to that time?

A. Mr. Grant was surely mistaken and he surely made the statement without any knowledge of the condition at that time. Mr.

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Grant was at that time living in Springfield and not giving the business any attention so that he was not able to judge. I might add to that that the business during 1899 was conducted at New York City and no records having been kept at Springfield.

X Q. 45. Are you familiar with the Shrewsbury & Talbott tire, the same being advertised under the name of the Shrewsbury & Talbott Cab & Noiseless Tire Co., Ltd., a design of which appears in "Defendants' Exhibit, The Shrewsbury & Talbott Single Folder Circular?"

Objected to as improper cross-examination.

A. I am familiar with the tire manufactured by this concern several years ago, but I have never seen the tire that this design represents.

X Q. 46. I hand you "Defendants' Exhibit, The Shrewsbury & Talbott Circular, Single Large Sheet Illustrated," and will ask you if you are familiar with the design appearing thereon under Section A, the words appearing thereunder being "The Original Carmont Noiseless Tire?"

Objections originally made to said exhibit in William Brewster's deposition now repeated.

A. Yes, sir, this is the tire which was in use in New York City, almost exclusively in the fall of '94, when we started a branch in New York City, and which we drove out of the market within six months, and I doubt if there is a single set of these tires in use in New York City today.

X Q. 47. Did you sell your tires at a lower price than was being received by those dealing in this noiseless tire?

A. When we first started in New York we did not have all of the sizes of tires required to meet the competition, and did sell the inch and one-half tire as against their inch and three-quarter tire for a little less money, but after a few months, when our tire became to be known, the Shrewsbury tire could not be sold at any price.

X Q. 48. Is it not now sold extensively in England; that is, what was commonly known as the Clincher tire?

Objected to as improper cross-examination, since this witness has not in his direct examination attempted to testify as to England.

A. It has been more than two years since I have been to Europe, and I am not familiar with the business. I do know, however, that the reports from our licensee in Great Britain show very great increase, and I know also that the only reason that the Clincher tire was sold at all was on account of the price, they making prices very much less than our licensee was willing to sell at. The same is true in France and Italy. I also observe in this same exhibit that Shrewsbury & Talbott advertise a two-wired tire which is evidence that their tire was being driven out of the market.

X Q. 49. Does not the exhibit rather show that the Clincher tire and the two-wired tire were being advertised and sold concurrently?

A. Yes, sir.

X Q. 50. I hand you a printed circular, being an advertisement

of the North British Rubber Company, of London, England, on the first page of which appears a design under which is written the "Clincher Rim", and on the last page of which is a rubber tire with two wires, and on the inside pages of which circular appear seven different designs of the Clincher tire, and will ask you what, if anything, you know in regard to this form of Clincher tire being now upon the market in England?

Objections to X Q. 48 repeated.

A. This circular shows but one design, but seven different sizes and is practically the same as the Shrewsbury tire. To what extent it is now used in England I am unable to say.

Counsel for defendants offers the circular presented to and examined by the witness in evidence and requests the Notary to mark the same "Defendants' Exhibit, The North British Rubber Company, Ltd., Circular."

The objections to X Q. 48 repeated to the offering of said exhibit.

X Q. 51. Did you on or about April 13, 1900, write to J. W. Scott, of Akron, Ohio, then in the employ of the Consolidated Rubber Tire Company, and say to him that among the attacks which you proposed to make upon the Goodyear Tire & Rubber Co., was to have one Fairchild go into interference with J. A. Burrows' patent on wing tires?

Question objected to, as improper cross-examination and as wholly immaterial to any issue in this case, which objection by consent is to apply once for all to all subsequent questions and answers relating to the same subject-matter.

A. I decline to answer.

X Q. 52. Please explain why you decline to answer.

A. I decline to answer.

X Q. 53. I beg to show you a copy of your said letter to Mr. Scott, the original having been destroyed by him as he testified in the interference proceeding referred to and will ask you to state whether you affirm or deny the authorship of the original represented by this copy?

Objections repeated and counsel insists that the question is immaterial to the issues in this case. especially since the record discloses that the Goodyear Tire & Rubber Co., have never used the device described in the patent in said interference, or at least that the tires proved by complainant to have been put into actual use were entirely different from that described in said patent, and the Court's attention is further called to the specification of the patent which states that whatever improvement there is, same is intended to be used on the rubber tires that were on the market, and counsel for complain*plain*ant insists that this line of cross-examination as to said interference proceeding, or letters relating to the same is wholly immaterial and is foreign to any of the direct examination of this witness.

Defendants' counsel replies to a portion of the above statement that the wing tires of defendants are exactly the wing tire covered

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by the Burrows patent, as testified to by Mr. C. W. Sieberling, an officer in the Goodyear Company.

In answer thereto complainants' counsel calls the Court's attention to the testimony of witnesses in St. Louis, Philadelphia, and Columbus, Ohio, together with the testimony of C. W. Harris and the pieces of Goodyear Wing tire marked "Complainants' Exhibit, Goodyear Wing Tire, Columbus, Ohio, Nos. 1 and 2." "Complainants' Exhibit, Goodyear Worn Wing Tire, Philadelphia, Nos. 1 and 2" and "Complainants' Exhibit, Goodyear Wing Tire Philadelphia, Nos. 1 and 2" and insists that the testimony of C. W. Sieberling is not at all decisive, but that he is contradicted by the testimony of at least five witnesses, and by devices which are shown to be the actual tires sold by said Goodyear Tire & Rubber Co.

Defendants' counsel replies that the very samples of wing tires referred to in the last statement above by opposing counsel are themselves wing tires such as covered by said Burrows patent.

Complainants' counsel suggests that the Court can determine this by a comparison of said exhibits with said Burrows patent and counsel insists that the question is improper cross-examination and is immaterial.

A. I decline to answer.

X Q. 54. I will also ask you whether you or the Consolidated Rubber Tire Company, through you or any of its officers procured the bringing about of said interference proceeding in the Patent Office between said Fairchild and said Burrows in respect to the Burrows patent on said wing tire?

Objections repeated.

A. Nobody connected with the Consolidated Rubber Tire Company had any authority to bring any such thing about, and if such was done, it was done personally, and on their own account.

X Q. 55. Well, will you affirm or deny that the Consolidated Rubber Tire Company, through you or some of its officers, did in fact, procure the bringing about of said interference?

Question objected to as already answered in addition to the objections already made.

A. My last answer answers this question fully.

X Q. 56. As I do not regard your previous answer to be one which replies to the last question, I will repeat the last question and ask you to answer it.

A. I decline to make any further answer.

X Q. 57. Do you affirm or deny that such interference proceeding has been brought about and is now an existing controversy before the Patent Office?

A. I decline to answer.

X Q. 58. Do you decline because you do not know or for some other reason.

A. I decline to answer.

X Q. 59. Do you affirm or deny that the Consolidated Rubber Tire Company remitted money to said F. F. Fairchild during the

time he was preparing to bring about this interference and thereafter and that there was an agreement betwen said Fairchild and the Consolidated Rubber Tire Company, respecting said interference?

The objections made to X Q. 53 are repeated and it is understood that the same are to apply once for all.

A. There was no arrangement of any kind between the Consolidated Rubber Tire Company and Mr. Fairchild and the only money remitted him was on account of salary.

X Q. 60. In view of your last answer I call your attention to copies of three letters, the originals of which were offered in evidence on behalf of Burrows in said interference case, said letters being under date of February 23, 1900, March 17, 1900 and April 17, 1900, and the copies I hand to you being identified as copies of the originals as offered in evidence in connection with the cross-examination of Mr. Border Bowman, one of your counsel, who testified on behalf of the junior party to said interference case, and I will ask you to kindly say whether you affirm or deny the genuineness of the letters of which these are copies, two of these letters being signed by the Consolidated Rubber Tire Company, per E. S. Kelly, and the other by said Company, per F. A. Seaman?

Objections repeated and further objected to as secondary evidence and counsel insists that this line of cross-examination is improper and that it is grossly unfair to fill up the record with recitations of defendants' counsel as to what he thinks has transpired in said alleged interference, which objections are now to apply to all further questions concerning the correspondence.

A. The letter signed by Mr. Seaman is an official letter and referred to a remittance which was simply an advancement and was to be taken out in his future services. The other two letters were intended to be personal and if the company's stamp was put over my signature it was unintentional.

X Q. 61. Then am I to understand that you personally procured the bringing about of said interference instead of the same having been brought about by you acting for the Consolidated Rubber Tire Company?

Objections repeated.

A. I decline to answer.

X Q. 62. Was said Fairchild at the time of the dates of these letters in your employ or in the employ of the Consolidated Rubber Tire Company?

Objections repeated.

A. I decline to answer.

The four copies of letters referred to by the witness when the same were presented to him are collectively handed to the Notary to be marked for identification as "Defendants' Exhibits, Kelly and Consolidated Company's Letters."

Defendants also give notice that if the same shall seem necessary, as they now believe it will be, they will give notice of an applica-

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tion to the Court for an order compelling the witness, E. S. Kelly, to answer the questions contained herein which he declines to answer.

Defendants also offer in evidence a certified copy by the Patent Office of the Declaration of Interference between Frank F. Fairchild and Joseph A. Burrows, being the interference referred to in the above questions, and request the Notary to mark the same "Defendant's Exhibit, Declaration Fairchild-Burrows Interference."

Said exhibit and the offer of said exhibit is objected to by complainants' counsel as immaterial and incompetent.

Complainants' counsel begs to notify defendants' counsel that he will wish to present to the Court a motion to strike out and eliminate from the record large parts of the evidence introduced by the defendants and that he will desire to present same at the time of any application that defendants determine to make as hereinbefore threatened.

X Q. 63. I will further ask you to state if it is not true that said Fairchild was induced or bargained with to assign his application involved in said interference to Mr. Paul A. Staley, one of the solicitors for the complainant herein, and if such transfer to him was not procured by the Consolidated Rubber Tire Company through yourself, or some other of its officers for the purpose of holding the title in said assignee as a matter of form, the real interest and ownership of such Fairchild application to be considered the property of the Consolidated Rubber Tire Company and to be hereafter transferred to it, the Consolidated Rubber Tire Company to pay the expense of this interference proceeding?

The question objected to as improper cross-examination as immaterial and as already answered, and the Court's attention is referred to the witness' answer to X Q. 54 and counsel insists that as to matters not touched upon in the direct examination defendants' counsel makes the witness his own and should be willing to abide by his previous answer.

A. No, sir; the Consolidated Rubber Tire Company had nothing to do with it.

X Q. 64. Who did?

Objections repeated.

A. I decline to answer.

X Q. 65. Why?

Objections repeated.

A. I decline to answer.

Defendants repeat the notice given above.

Redirect examination by Mr. BOWMAN:

Re-D. Q. 66. Referring to your cross-examination as to the size of the tire, to-wit: four inch employing four wires, will you please

state whether or not you have decided upon that form of tire as a permanent thing? I mean as to the four wires?

A. We have abandoned the four wires for all purposes except for fire engine purposes and our largest four-inch tire and even for this purpose it is practically an experiment.

E. S. KELLY.

* * * * * * *

And thereupon, ARTHUR W. GRANT, a witness produced on behalf of complainants, being first duly sworn, testifies as follows in answer to interrogatories proposed by Mr. BOWMAN:

Q. 1. Please state your name, age, residence and occupation?

A. Arthur W. Grant; age, 41; Springfield, Ohio; retired manufacturer.

Q. 2. Are you the A. W. Grant, patentee of letters-patent No. 554,675, the patent in suit?

A. I am.

Q. 3. I call your attention to letters-patent No. 529,474, issued November 20, 1894, to T. B. Blosser and J. P. Kunkle, and ask you to state whether or not you are acquainted with those parties, and if so, the circumstances under which you have known them and how long you have known them?

A. I am acquainted with both of the gentlemen and have known them since about 1885 or 1886, at which time they entered my employment I being connected at that time with the Tricycle Manufacturing Company as assistant superintendent. They stayed in my employment until the fall of 1893, Mr. Kunkle, as I remember it, continuously, and Mr. Blosser off and on for that length of time.

Q. 4. Referring to the said patent to Blosser and Kunkle, the application date appears to be July 23, 1894. I will ask you what with reference to that date it was that you began the manufacture and sale of the tire like the patent in suit?

A. Mr. Kelly and myself started in to manufacture and sell rubber tires on New Year's, '94.

Q. 5. Please state what opportunities Blosser and Kunkle had to examine the tire of the patent in suit and the one that you manufactured in 1894?

A. Shortly after Mr. Kelly and myself started in business Mr. Blosser called on me on several different occasions. On one of his visits he spoke to me about a device for fastening metal rims onto the ordinary wooden wheel spokes, giving me to understand that it was a device gotten up by a man in the employment of the Tricycle Manufacturing Company, by the name, I believe, of Taylor. He showed me a model at that time, of the device and this model was composed of a short section of wood spoke metal rim and rubber tire. The metal rim and rubber tire in this model was the same as then used by the Tricycle Manufacturing Company. He said at that time that the man, Taylor, had given him the device, or rather him and Mr. Kunkle, and that he was figuring with one Mr. Farrell to have it patented, Mr. Farrell to furnish the money to pay the expense of taking out the patent for an interest in same. He also

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asked me at that time whether it would be possible for them to make arrangements with us to use our tire in case they decided to apply for a patent and was successful in obtaining the same, in which case they were thinking of manufacturing the wheels at the West End Malleable, Mr. Farrell being a stockholder in that concern. I told him I thought arrangements of that kind could be made. He then asked me to let him have a sample or short section of our steel channel and rubber tire, so that he could make another model similar to the one that he had with the exception of its having our steel channel and rubber tire instead of the one used by the Tricycle Manufacturing Company. His object in wanting them was, so he stated, to show Mr. Farrell just how the device would look in connection with our steel channel and rubber tire and he thought it would assist him in persuading Mr. Farrell to go in with him. The short sections I furnished them at that time, as he requested.

Q. 6. Do I understand that the samples were furnished him prior to the date of his application for patent?

Defendants object to the question as leading.

A. They were, for up to that time he had not persuaded Mr. Farrell to furnish the money for the patent and there had been no steps taken in making the application, so I understood.

Q. 6. You have referred to the time when you first began the manufacture of rubber tires as New Year's, '94. Please state, if you remember, when it was you began the manufacture of what has been called the molded tire, or rubber tires made from molds?

A. I do not remember exactly, but it was early in the spring of '94, as the tire which was made in the tube machine we did not use but a short time, as they proved defective from air bubbles, which could be entirely overcome by molding the tire.

Cross-examination by Mr. TOULMIN:

X Q. 7. Did the sample of rubber which you say you furnished Mr. Blosser have a flat, smooth bottom?

A. I will have to ask you to make your question a little more plain, as the tires all have a smooth bottom, and as I remember it, always had.

X Q. 8. I mean was the sample of tire which you say you furnished Mr. Blosser straight across the bottom just as the tire that is shown in the Grant patent in suit forms a straight line across the bottom?

A. As I remember it, it was. It would naturally be so, as all the tires we made were in that way.

X Q. 9. Will you please state what was the shape in cross-section of the rubber tire which you began to manufacture in January, 1894?

A. Very similar to the tire shown in patent in suit with the exception that a small part of the tread of the tire was flat where it is shown in the patent round.

X Q. 10. What was the shape of the molded tire in its cross-section?

A. The same as the patent in suit.

X Q. 11. I notice that in the case of The Rubber Tire Wheel Company vs. The American Rubber Tire Company, in a deposition given by you in April, 1897, answering X Q. 55, you stated that you got up the present tire about July or August of 1894, meaning the tire shown by patent in suit. Is that correct?

Question objected to on the ground that it picks out only part of the testimony given in that case by this witness.

A. As I understand it, I did not say positively at that time that it was July or August, but about that time, but as I now remember it, and I think a number of my later depositions will show, that it was considerably earlier than that, possibly as early as March.

X Q. 12. Also in answering X Q. 66 in that deposition, in which you were asked to "fix as nearly as you can the time when you first began experimenting with the tire described in the patent in suit" you said: "I cannot remember the exact time, but it was sometime in the latter half of 1894." Thus having first stated in answer to Q. 55 that you got up this tire in August of '94, and then that you did so in the latter half of 1894. I again ask you if the dates then stated, which were stated not long after their occurrence, were not correct?

Objection repeated.

A. They are not. At the time I gave that testimony I had had no occasion to refresh my memory or look up the dates, but since that time, on several occasions, the matter has come up again and caused me to study the matter more thoroughly and look up dates and in doing so we found at least a part of the correspondence where the molds for this tire shown in patent in suit were ordered made by the Goodrich people of Akron, and I certainly must have got up the tire before the molds for same were ordered, and the molds were ordered early in the spring of '94, the exact date I do not remember now, but I think it would be very easy to find this correspondence spoken of, which would show when the molds were ordered, and I have no doubt but what the tire was gotten up some time before we decided to go to the expense of having the molds made, as they charged us $110.00 for each mold.

X Q. 13. In your first deposition given in the suit of The Rubber Tire Wheel Company vs. The Victor Rubber Tire Company, answering direct question 9, you quote from the specification of the patent in suit these words, "the rubber tire proper is formed of substantially the same depth as width," then you stated that the object of this you found after experimenting was that it was necessary to have a tire of about the same depth as width in order to carry the load that the tire was subjected to. Do you still make that statement?

Question objected to as improper cross-examination.

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A. I still think that that gives the best results everything considered.

X Q. 14. In the same deposition, answering X Q. 53, you stated that you thought the space between the side of the rubber and the upper inner part of the channel iron had no more to do nor as much with the success of the tire as the receding of the sides of the rubber away from the periphery of the flanges. Do you still repeat that statement?

Objection repeated, and it is further objected to as not accurately stating the former testimony of the witness.

Defendants reply that the statement is in strict accord with the former question and answer.

Complainants call the Court's attention to the fact that one cross-question and answer are selected out of a number and attention is particularly called to the preceding questions and answers in said cross-examination, and counsel insists that it is improper to cross-examine now as to matters not touched upon in the direct examination, which objections are by consent to apply once for all.

A. I do in the same spirit that I no doubt did at that time; that is, that that particular point of itself and alone does not constitute a successful tire, but in combination with other essential points it lends its assistance to a successful tire.

X Q. 16. Please state what you refer to by that particular point?

A. The same that you stated in your question, that is, the space between the side of the rubber and the upper inner part of the channel iron.

X Q. 17. Answering X Q. 54 of the same deposition, you stated that just how far below the periphery of the flanges it was necessary to start with this receding of the rubber in order to obtain a successful tire you were not able to state, as that only could be proven by experience, but that you did not believe it necessary to go very far below the periphery of the flanges. Do you still say that it is not necessary to go very far below the periphery of the flanges with the corner of the rubber where it begins to recede from the flange?

A. Generally speaking, yes. The different sized tires I think should vary according to the size of the tire. In some possibly a sixteenth of an inch is sufficient, where in others it might require an eighth of an inch. Then again these distances might be increased to twice that amount and possibly do no harm.

X Q. 18. Answering X Q. 63 of that deposition you stated that the tires that were then sold by The Rubber Tire Wheel Company had very small space at the place spoken of, but not as large as shown in the drawings of the patent in suit? Does that statement still hold good as to rubber tires made and sold by the complainants?

A. Yes, broadly speaking, some sizes have less and other sizes have approximately more than shown in the drawing of patent in suit, and I expect that an average size would possibly be a little less than shown in the drawing of the patent in suit.

X Q. 19. In answering X Q. 64 of that deposition, you said you did not think that the space in itself is considered an essential

feature, but in making a tire embodying the essential features this space would naturally more or less occur. Do you so state also at this time?

Complainants' counsel again protests against picking out extracts of answers in the former deposition and the Court's attention is called to the deposition itself, particularly the question and answer as quoted from and preceding questions and answers as showing what is the fact testified to.

A. I do; that is to say, I think it would be possible to make a tire having a space at this point and still to have the tire so shaped that it would be a total failure when put in actual use.

X Q. 20. Judging from the latter part of your answer, you seem to have misunderstood the question. I will therefore again ask you if the space in question is an essential feature of rubber tires made under the Grant patent?

Complainants' counsel objects to the inference in the question that the witness did not understand the previous question and insists that the answer is responsive and that this question was fully answered by the previous answer and explains what the witness meant in his former testimony.

A. After reading over your X Q. 19 and reading my answer to same, I cannot see where I can answer it any more definite than I did.

X Q. 21. Aside from whether you can be more definite or not, I again ask you whether the space in question is an essential feature in rubber tires made under the Grant patent?

A. I do not, as explained in my answer to your X Q. 19.

X Q. 22. I wish you would state whether in the beginning of the business of The Rubber Tire Wheel Company and until 1897, it was the practice to unit- the ends of the retaining wires after they were put through the rubber tires and then to spring the wires and rubber over one end of the flanges and into the channel iron?

Objected to as immaterial and as improper cross-examination.

A. I cannot state definitely without time to study the matter up and look up dates, but I think the change was made before '97.

X Q. 23. But that was the first method of applying tires to the channel iron, was it not?

Objections repeated.

A. It was.

X Q. 24. And the method adopted after the change you spoke of consists in placing the rubber with the wires run through it into the channel iron before the ends of the wires were united and in drawing the wires tight while the rubber is in the channel iron and securing the ends of the wires while so drawn.

Objections repeated.

A. That was the change spoken of, but all of the tire- are not put on in that way. Some of them are still sprung on.

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X Q. 25. Are the larger sizes put on by this second method?

A. By both methods.

X Q. 26. Then what was the object in adopting the second method?

A. Quicker way of putting them on.

X Q. 27. And the second method also has the advantage of making the wires tighter after the rubber is in place in the channel iron, has it not?

Objections repeated and complainants' counsel insists that defendants have no right to cross-examine the witness in this manner as to matters in no way touched upon in the direct examination, and if counsel insists in continuing this method, counsel for complainants will instruct the witness that he may use his discretion as to answering such questions.

Defendants insist that the witness being the patentee of the patent in suit, and having been lately in interest in manufacturing these tires, it is proper that defendants ascertain from him the matters inquired about as they will be shown to have an important bearing on the theories introduced by complainants' expert.

A. That is a disputed question.

X Q. 28. Will you please state about how many pounds per wire of tensile strain the retaining wires are subjected to in the tires manufactured and sold by the complainants, speaking of the wires as they are when the rubber is in the channel iron and ready for use?

Objections repeated.

A. I have never had any way of knowing.

X Q. 29. In answering X Q. 87, in your second deposition, given in the case of The Rubber Tire Wheel Company vs. The Victor Rubber Tire Company, you said the aim was to graduate the amount of tension to the size of the tire, beginning with twenty-five pounds on the smaller sizes and increasing with the size of the tire till in the two inch you would give it all it was possible to give without breaking the wires when springing them over, but just what this tension was on the larger sizes you never tried to figure out, and you know of no way it could be figured out, but your ideas were that if you could get two hundred pounds tension per wire on the larger sizes it would be sufficient. The tension varied with the size of the tire in each of the sizes. Will you please state whether you are willing at this time to adopt that answer?

Objections repeated.

A. Did I understand you to say that I said in my former deposition spoken of, that I put twenty-five pounds on the smaller size tire?

X Q. 30. I so stated in reading your answer to X Q. 87 of that deposition which I now hand to you and ask you to read and state whether you will now adopt that answer?

Objections repeated, and the Court's attention is called to previous

questions and answers and the subsequent ones in that Victor Company case.

A. I have no reasons to change the views that I held at the time of giving that testimony.

X Q. 31. Will you please state what the tensile strength is of the wires used in complainants' tire, say for several sizes which you may mention?

Objections repeated.

A. Nobody knows only approximately as the tensile strength of the wire varies.

X Q. 32. What is the tensile strength that is sought to be gotten in these wires, and in this connection I ask you to read your answer to X Q. 90 in your said former deposition in the Victor case?

Objections repeated.

A. My answer at that time was guess work to a great extent and the rolling mills would be the only ones that I know of that could give the tensile strength of these wires.

X Q. 33. What tensile strain do they undergo in the act of springing them over the channel iron in applying the rubber tires by complainants?

A. I don't know.

X Q. 34. If you will read your answer to X Q. 90 referred to above I think you will be able to answer the question. Please do so.

Objections repeated.

A. In my answer at that time I stated that we had no way of determining the strain, and so far as I know there never has been.

X Q. 35. In your said answer to X Q. 90, you said: "We had no way of determining what this strain was, but I do know that it was very considerable, as we would sometimes break the wires, and while I never tested it, my experience would lead me to believe that it would take in the neighborhood of a thousand pounds to break one of the wires in an inch and one-half at that time, as we were then using a larger wire in the one and one-half tire than we are at present. In the three-quarter tire, which was a much smaller tire, it would probably break at 300 or 400 pounds strain; seven-eighths and inch had the same size wire at that time. These three sizes at present are larger. The one and a quarter and one and three-eighths had, as I remember it, the same sized wire as at present, which would probably break at 700 or 800 pounds strain." I will ask you if you are willing to adopt that answer at that time?

Objections repeated.

A. I am no better posted in the tensile strength of the wire at this time than I was at that time, consequently that is as good a guess as I could make now.

X Q. 36. I will further ask you if as a matter of fact the matter of the tension of the wires as they shall be when the tires *is* ready for use is not left entirely to the judgment of the workmen to determine whether or not he has the proper tension by the rigid or slack

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feeling of the tire and in this connection I call your attention to X Q. 98 of your former deposition?

A. Yes.

Redirect examination by Mr. BOWMAN:

Re-D. Q. 37. Referring to your answer to X Q. 12, where you speak of correspondence as to the molds, I call your attention to correspondence identified in this case as "Complainants' Exhibit, Correspondence with Goodrich Company about Molds" and ask you if that is the correspondence referred to?

A. Yes, sir.

Re-D. Q. 38. Do you remember how soon after that letter of April 2 was it, that you ordered the molds?

A. I do not remember, but I think it was very soon; possibly in two or three days.

ARTHUR W. GRANT.

* * * * * * *

PY

[redacted]

IN THE

SUPREME COURT OF THE UNITED STATES.

[redacted]

DIAMOND RUBBER COMPANY OF NEW YORK,

Petitioner,

CONSOLIDATED RUBBER TIRE CO. AND THE RUBBER TIRE WHEEL CO.,

Respondents.

ON WRIT OF [redacted]

BRIEF AND [redacted] FOR PETITIONER.

By CHARLES [redacted]

[redacted]

OPY

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IN THE

Supreme Court of the United States,

OCTOBER TERM, A. D. 1909.

No. 36.

DIAMOND RUBBER COMPANY OF NEW YORK,
Petitioner,

vs.

CONSOLIDATED RUBBER TIRE CO. AND THE RUBBER TIRE WHEEL CO.,
Respondent.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT.

Brief and Argument for Petitioner-Appellant.

BY

CHARLES K. OFFIELD.

Statement of Case as to Parties.

MAY IT PLEASE THE COURT:

The petitioner, the Diamond Rubber Company of New York, who was the defendant at the circuit, and the defendant appellant in the United States Circuit Court of Appeals for the Second Circuit, and the petitioner in this court, is a New York corporation having its place of business in the City,

County and State of New York. The principal occupation or business of the petitioner is the handling and sale of a solid rubber formation, to be cut up into lengths suitable for forming into solid rubber tires for wheeled vehicles of various types. The petitioner neither manufactures nor uses these formations of solid rubber or solid rubber tires upon any wheeled vehicles.

The respondent appellees, the Consolidated Rubber Tire Co. and the Rubber Tire Wheel Co., are corporate organizations respectively of the States of New Jersey and Ohio. The Consolidated Company manufactures and sells solid rubber in the form of rubber tires and accompanying rims for wheeled vehicles in the City and State of New York. The Rubber Tire Wheel Co. neither manufactures, sells nor uses solid rubber in the form of rubber tires or otherwise.

Statement of Case as to Subject Matter.

This case relates, as to subject matter, entirely to a single letters patent. The bill of complaint contains the usual allegations present in all patent suits praying an injunction and an accounting. (Rec., pp. 1-6.) The patent in suit are letters patent granted to one Arthur W. Grant under date of February 18, 1896, and No. 554,675, for an alleged new and useful improvement in rubber tired wheels. The Consolidated Company claims to be the exclusive licensee of the Rubber Tire Wheel Co. under said letters patent, and the presence of the Rubber Tire Wheel Co. as joint complainants

in this litigation is justified only by the asserted ownership of the naked legal title to the said letters patent. The Diamond Company, petitioner, is alleged to infringe this Grant patent by the purchase and sale, and by infrequent instances of application for use, of the device or tire of the Grant patent, in some way or in some manner not particularly defined, the only instance of proof of such alleged infringement being shown in two exhibits present in this case and marked respectively, "Complainants' Exhibit, Defendant's Rubber Tire," and "Complainatn's Exhibit, Section Diamond Company Tire." There are but two claims to said Grant patent, and both claims are alleged to be infringed, the solid rubber lengths or tires thus alleged to be an infringement being manufactured at Akron, Ohio, by a corporation of that state—the Diamond Rubber Company of Akron, Ohio, and purchased by the petitioner only from that company in that state; the solid rubber lengths so purchased by the petitioner being continuous long lengths like a clothesline and wound frequently like a clothesline on a reel and so sold.

The answer in this case is the usual answer in all patent cases with one or two exceptions, as will hereafter appear. (Rec., pp. 79-92.) It will be a matter of convenience hereafter, for conciseness, to court and counsel, to speak in this brief of the petitioner as the Diamond Company, the respondent as the Consolidated Company and the patent in suit as the Grant patent. We take it that it will be without profit as a justification for the presence of this case in this court, to attempt to justify such

presence by any close recital of the formal or technical rules of procedure thought to be necessary in the court below. The case is now here in this great court, and will be taken up and passed upon with an eye single only to the justice and merits of the case and the rights, legal and equitable, of the parties litigant, irrespective of the numerous complicated litigations as to this patent antecedent to its presence in this court. If it is necessary to refer, for any reason, to the Assignment of Errors asserted in the Court of Appeals, under the usual formula, such assignment will be found with allowed petition for appeal on. (Rec., pp. 674-5.)

The patent was held valid at the circuit and infringed—Judge Holt's opinion. (Rec., pp. 672-3.) The decree of the court below was affirmed by the Court of Appeals of the Second Circuit. (Rec., pp. 681-4.) A petition for rehearing was filed in due order of time and denied. (Rec., pp. 684-693.) The petition for certiorari was filed in this court July 24, 1908, and granted upon October 21, 1908, and in due order of time the record was lodged in this court and printed as of the October term, 1909, under No. 209.

The Grant Patent in Suit.

Before presenting to your Honors the various litigations and opinions of courts and judges in the different circuits as to this Grant patent in suit, and the claims made for it pro and con, we deem it advisable for a more full and better understanding of the questions at suit that your Honors should

obtain a familiarity with this Grant patent solely from the face of the patent itself. The Grant patent is found on Rec., pp. 76-78. We herewith reproduce the four drawings of said patent as showing the entire device of Grant and the construction of that device, as identified by the two claims, it being only necessary to read the claims of the patent in connection with these drawings to understand fully everything that Grant did in the then crowded art to which this patent relates. The following are the drawings:

(No Model.)

A. W. GRANT.

RUBBER TIRED WHEEL.

No. 554,675. Patented Feb. 18, 1896.

Fig 1

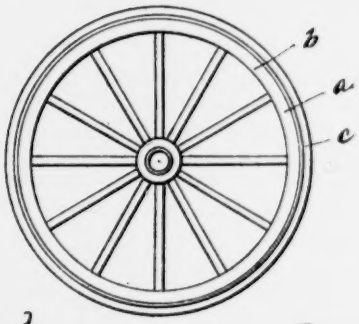


Fig 1c

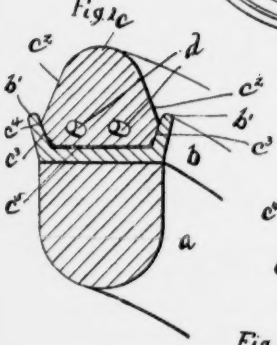


Fig 4.

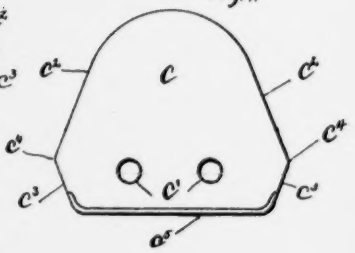
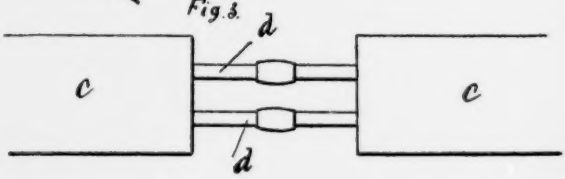


Fig 3.



Witnesses
Chas. G. Wolcott
F. L. Walker

Inventor
Arthur W. Grant
By his Attorney
Chas. A. Wolcott

The claims read as follows:

"1. A vehicle-wheel having a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

"2. A vehicle-wheel having a metallic rim with outwardly projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining wires in said openings, and a reinforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges, substantially as specified."

The only difference your Honors will see between the two claims is the so-called reinforcing strip of fibrous material placed at the bottom of the tire, wholly within the flanges. These claims on their face are narrow and specific, and their technicality as to details and the uncertainty of the shown structure, as to the application and result, is intensified and made plain by reference to the specifica-

tions. Grant thus describes the four drawings just illustrated as follows:

> "In the accompanying drawings, figure 1 is a side elevation of a wheel embodying my invention. Figure 2 is a sectional elevation of the wheel rim, shown partly in perspective. Figure 3 is a partial longitudinal section through the tire, showing the openings for the retaining wires. Figure 4 is a transverse sectional view of the rubber tire in detail."

It will be seen by Grant's specifications that he states that his *invention* "consists in the *constructions and combinations of parts hereafter described*, and set forth in the claims" (italics ours).

The patentee then, after describing his metallic channel rim, states:

> "In this groove or channel I place a rubber tire (c) which is of peculiar shape."

The patentee then goes on and describes this peculiar shaped tire precisely and exactly, itemized and in detail, as follows:

> "It is provided throughout its length with openings c' c', through which are passed retaining wires d. These retaining wires are separate and independent and extend entirely through the openings c', and the ends of each of said retaining wires are united together after the rubber has been compressed endwise on said wires, thus forming two independent and continuous retaining wires within the rubber tire, the ends of which, by reason of the compression, are brought together so as to entirely cover the wires and the united ends thereof.
>
> "The tire proper, c, is formed of substantially the same depth as width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of

the rim, the exposed sides of the tire being formed preferably on the lines c^2, at an angle to each other and also to the flanges b′ of the wheel rim. The unexposed portion of the tire, or that portion which is inclosed within the rim, is formed of substantially the same shape as the inner channel of the rim—that is to say, it is tapered from the outside inwardly—so that the sides of the inner or unexposed portion of the tire are also formed on the lines c^3, forming with the lines c^2 an obtuse angle. The lines c^3, however, are less in length than the inside of the flanges b′, so that angle or corner c^4, between the sides c^2 and c^3, falls below the outer periphery of the flange b′ and within the channel between said flanges. The openings c′ through which the retaining wires pass are also formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b′.

"The bottom portion of the tire is reinforced with a canvas strip c^5, which covers the entire bottom and may project slightly along the sides c^3, but does not in any case extend up as far as the angle or corner c^4.

"The tire has been described thus minutely because the constructions described are important."

The patentee then describes the purposes of this peculiar construction prevents the tires from being forced over the sides of the flange, thus preventing cutting or grooving of the tire, and describes also the efficacy of the reinforcing strip of canvas on the bottom of the tire. It would thus seem, simply from an inspection of the patent itself, that the thing described and claimed was without patenta-

ble novelty or invention, determined simply from an examination of the patent on its face, all of the parts being old and exhibiting only a selective choice in their combination and alliance. Of course any mechanic, even an ordinary mechanic, would so mould the rubber to form the tier, and would so form a retaining flange, as not to produce a cutting edge for the destruction of the tire itself; equally of course also, if any difficulty was found in the wearing or abrasion of the tire base in the channel, would use a common well-known reinforcing strip of canvas to be applied at this point. Manifestly also, a rubber tire thus formed and located in a channel rim would run in such rim and retain its position under any stress of travel in actual use that would not produce a distorting or wrenching effect upon the tire itself. The weight of the carriage or the load itself upon the wheel and tire would all be in the direction of keeping the tire in its place and preventing its dislodgment from its flanged holding. If the wheel should run always upon a smooth asphalt pavement the tire would keep its place of necessity and would and could not roll out. Manifestly then, the only use of the two wires shown in the drawings are for the purpose of "*retaining*" the tire in its place when a force would be exerted upon it that otherwise would cause it to be displaced or rolled from its channel. Without any doubt then, these two wires will have the sole purpose only of retaining the tire in its channel under these conditions, and therefore all through the patent these wires are spoken of always as "*retaining wires.*" It will be noticed also that the patent

provides for an exact location of these wires. The drawings identify this location specifically in Figures 2 and 4, and the specification provides that the tops of the openings through which these retaining wires pass are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b'. The patent provides that these retaining wires are separate and independent and extending entirely through their respective openings, "and the ends of each of said retaining wires are united together after the rubber has been compressed endwise on said wires, thus forming two independent and retaining wires within the rubber tire, the ends of which, by reason of the compression, are brought together so as to entirely cover the wires and the united ends thereof."

There is nothing in this patent from beginning to end to show how these united ends are formed or produced, except in Figure 3 that shows an enlargement by brazing or otherwise, to produce these united ends. Figure 3 evidently shows also the rubber as compressed near the united ends so that it may be made to flow back and cover the ends. It will thus be seen that metallic wires so arranged, being without elasticity or capability of longitudinal stretching, would, of necessity, do exactly what the patent claims for them, that is, retain the rubber tire itself at its base under unusual tortion or stress, and prevent the tire from being rolled out of its channel. There is nowhere from beginning to end in this Grant patent any intimation or suggestion that any strain or tightened effect is

given to these retaining wires. Indeed, if they are "retaining wires" only, they are evidently and manifestly placed there without any intention of any straining or clamping effect, but only for the purpose of standing guard and retaining the tire in place under unusual conditions that otherwise would roll the tire from its channel unless retained by the wires. We have thus been particular in pointing out the location of these wires and the evident function and operation and purpose of their presence in this tire, because it is only by a strained, unnatural and idealized condition that may be given to these wires, nowhere suggested in the patent and impossible of conception from the statements of the patent itself, that patentable novelty has been given to this patent and its validity found by the courts in this case, as will hereafter appear.

Absolute Confirmation of This Function of the Retaining Wires as Contemplated by Grant Found in This Record.

The patent, as has been seen, is entirely silent as to how the two free ends of these retaining wires respectively are to be "united." It would seem from the patent itself that the rubber tire with the two wire threads through the respective openings in the tire, were to be placed in position in the rim, and then united. As a matter of fact, however, this record shows that the tires themselves were formed of the desired length, the ends of the wires united and then the tire forced over the flanges and into the rim, this being possible by reason of

the entire periphery being available for this purpose, and the relation of the wires to the tire being fixed by these openings. It is, of course, equally obvious that the force which would be necessary to spring or jump the tire onto the wheel rim when the entire periphery of the rim was available for that purpose—that such force could not be present in any actual use of the tires to spring or jump the tire out of the rim, as the weight of the vehicle and load is always directly above the contact portion of the tire with the ground or street pavement in travel. That Grant so "united" the ends of the "retaining wires" and jumped the tire into the rim is shown by complainant's leading practical witness in this record. (Rec., 75; X-Q. 131.):

> "But in the early beginning of putting on these Grant tires it was the universal custom to fasten the ends of the wires and complete the tire before jumping over the rim, was it not?
>
> "A. Yes, sir; to my knowledge that was the first way of applying them at the start."

Antecedent and Co-Temporaneous Litigations Concerning This Grant Patent.

This patent has had a stormy career in the courts, beginning several years over a decade ago, and continuing until the present time, the contest raging in extent in the Second, Sixth and Seventh Federal Circuits. The litigations identified prior to this case are as follows: The patent was sustained in the Second Circuit by Judge Thomas (*Rubber Tire Wheel Co.* v. *Pneumatic Wagon Wheel Co.*, 91 F. R. 978); in the Sixth Circuit (N. Dist of Ohio)

by Judge Wing, unreported; in the Fifth Circuit by Judge Newman (*Consolidated Rubber Tire Co.* v. *Finley R. T. Co.*, 116 F. R. 629). It was held invalid by the Court of Appeals, Sixth Circuit, in *Goodyear Tire & R. Co.* v. *Rubber T. W. Co.*, 116 F. R. 363, and in *Rubber Co.* v. *Victor Tire Co.*, 123 F. R. 85, and by Judge Anderson in the Seventh Circuit, District of Indiana, unreported. A certiorari to review the decision of the C. C. A., Sixth Circuit, was denied, 187 U. S. 641. The patent was also indirectly involved in the decision of *Rubber Tire W. Co.* v. *Milwaukee R. Works*, 142 F. R. 531. It came before Judge Platt in the Second Circuit in the Firestone case, 147 F. R. 739, and was again sustained, and upon the appeal from his decision the Court of Appeals' opinion in that case, 151 F. R. 237, was rendered.

Petitioner's Defenses to the Grant Patent in Suit and This Action.

We have deemed it best, however, before presenting to the court the opinions of the Second Circuit Court of Appeals and of the Court of Appeals of the Sixth Circuit, discussing all of these questions relating to the validity and scope of the Grant patent, to present to this court the defenses in this case separately and singly, from the discussions of the patent in the several litigations, as an independent discussion and presentation of the facts as present in this case, as it may better enable this court to determine the rightfulness of the diametrically opposite conclusions of the two circuit courts

of appeal which have passed upon the principal questions in this case.

The defenses to this Grant patent in this action may be aligned and epitomized as follows:

I.

The invalidity of the Grant patent is shown and assured by the old art.

II.

The Grant patent rightly construed, the petitioning defendant does not infringe.

III.

The device proceeded against as an infringement having been manufactured and sold in the Sixth Circuit where and since this Grant patent has been declared invalid, such device cannot be proceeded against in the Second Circuit as an infringement.

We will now take up and dispose of these defenses in the order above enumerated. The old art is represented in this case by a separate book marked "Old Patent Exhibits." Every one of these patents relate directly or indirectly to solid rubber tires upon wheel rims, and follow each other in rapid and unbroken succession from nearly a third of a century ago down to the present time. The drawings of all of these patents tell their own story and simply a cursory inspection of them shows the truth

of the assertion that at the time of Grant's appearance in this industry the old art was crowded with numerous prototypes and predecessors of this Grant tire, with every thought and suggestion of novelty and utility that can be found in the drawings and specifications of the Grant patent, or even in the idealized contentions as to the patent by the visions and dreams of the experts and counsel for the patent.

We have, however, in compliance with the labor-saving rule laid down in this court in *Topliff* v. *Topliff*, *supra*, selected two patents only of this old art, believing that these patents anticipate everything of invention in this Grant patent, and that if they do not show anticipation, none of the others will show it, and if they do anticipate the Grant patent, it is entirely immaterial whether the others do or not. The two patents so selected are the last two English patents in the book of "Old Patent Exhibits," and are British patents to Willoughby, the one of March 26, 1892, No. 5,924, and of October 10, 1892, No. 18,030, and are found upon pages 136 and 141 of the book of "Old Patent Exhibits."

The record in this case is replete with a large number of old patents—United States and foreign—relating to solid rubber tires, with a wide variety of forms and shapes, and of the application of these solid rubber tires to a wide variety of metal rims, also of various forms and shapes. Some of these old patent exhibits disclose an approximation to this Grant patent in suit, as to parallelisms of construction and operation, so closely that there would

really seem to be no opportunity for substantial differences, either as to construction or result, between the Grant tire and patent and the old art.

In this case the mechanical expert of the petitioning defendant—the Diamond Rubber Company of New York—Mr. Samuel N. Pond, selected from this old art the two Willoughby British patents, above identified, as of prime importance in anticipating every thought and shade and idea of invention or otherwise, disclosed in the Grant patent. Mr. Pond so stated upon cross-examination. (Rec., p. 179; X-Q. 18 and A.) Mr. Pond's analysis and presentation of these two British Willoughby patents is found upon (Rec., pp. 123-8.)

We desire to associate ourselves with and adopt the testimony of Mr. Pond, and his analysis of these English Willoughby patents, and his presentation of them as complete defenses to the Grant patent in suit, and we do this for the reasons, in the first instance, that Mr. Pond's presentation of these patents is a fair and logical review of these anticipating patents, and their anticipations of Grant, with convincing reasons given therefor, and for the further reason that in the litigation upon this Grant patent in the Court of Appeals of the Second Circuit, that court seemed to have accepted, as a fatality to the contentions of the defendant in the Firestone case, erroneous and wrong conclusions of defendant's single expert witness examined in that case, and therefore found against the defendant, by reason of admissions and statements made by the mechanical expert exam-

ined in defendant's behalf, and to the apparent exclusion of any consideration of the old prior art, aside from the single instance of selection of this expert witness, the patent there selected in the Firestone case being the Letta patent, not relied upon or referred to, except perhaps incidentally, anywhere in this record.

For these reasons, at the risk of appearing to give offense by extended quotations from expert testimony, we here quote the salient part of Mr. Pond's deposition, found in Rec., pp. 123-8, as follows:

> "British Patent to Willoughby, No. 5,924, March 26, 1892. British Patent to Willoughby, No. 18,030, October 10, 1892.
>
> "These two patents, and especially the earlier, I regard as of prime importance in relation to the question of the novelty or otherwise of the alleged invention of the Grant patent in suit at the time the application therefor was filed in the Patent Office. Referring first to No. 5,924, the patentee states: 'My invention is an improved method of securing rubber tyres to their rims, or in the case of a built-up air-inflated tyre, of securing the outer casing of the tyre to the rim.' The patentee then proceeds to describe the novel feature of his invention as consisting of one or more flexible metal coils, which may be either continuous circles of coil or lengths of coil interpieced with one or more length of addition metal rod or wire (uncoiled), or formed of lengths of coil alternating with straight or uncoiled lengths of their own metal rod in its uncoiled condition. The patentee states that these tire-fastening rods or coils may be passed through a hole formed lengthways in the rubber tire with their ends united; or they may be molded with the rubber

of the tire in the molding operation. In the drawings of the patent are shown a variety of forms of channel rims. For instance, in Figs. 5 and 7[a] is shown a rim in which the side flanges are at right angles or perpendicular to the base of the channel; in Figs. 8 and 8[a] is shown a rim in which the side flanges incline inwardly of the channel; and in Fig. 8 is shown a rim in in which the side flanges incline outwardly of the channel. In all of these cases, the inner or base portion of the tire is fitted to a snug seat in the channel. Regarding the manner of application of the tire to the channel rim, the patentee has this to say, on lines 28 to 34 of page 2 of the complete specification:

> " 'To apply my invention to ordinary vehicle wheels I select those already tyred with a "carmont" or somewhat similar shaped channel rim as in Figs. 5, 8, and 8[a], or in the case of new wheels, I provide them with a channel tyre and into this channel I spring my hooped rubber and coil combination or lay the rubber and coil combination around the wheel in the channel before the ends are united and by forcibly drawing the ends of the coil or coils together and uniting them I form the tyre upon the wheel without having to stretch it over the flanges of the channel rim.'

"In Fig. 8[a] of this patent I find clearly shown a construction which answers claim 1 of the Grant patent in suit in every detail. In this figure I find, as part of a vehicle wheel, 'a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides.' I also find 'a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer peri-

phery of the flanges'; and I also find 'independent retaining wires passing entirely through the inner portion of said tire and also within the outer peripheries of the flanges.' In claim 1 of the patent in suit the expression 'angularly projecting flanges' has reference to the rim on which the flanges are formed. In a broad sense the term 'angularly projecting,' as applied to a flange, is tautological. Any flange projects at an angle to the surface on which it is formed, or it is not a flange. It is my understanding and belief, however, that in the claim I am considering the patentee intended to designate and point out flanges which were disposed at an angle to the plane of the wheel; in other words, to distinguish from a structure like that shown, for instance, in the old Greene patent No. 169,100, of October 26, 1875, in which the flanges are parallel with the plane of the wheel or normal to the base of the channel. In accordance with this interpretation, the claim would define a construction in which the flanges or side walls of the channel leaned either inwardly of the channel, as shown for instance in Fig. 8ª of the British patent I am discussing, or as shown in the Grant patent in suit, in which the flanges or side walls lean outwardly of the channel. Similarly, the expression 'outwardly projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides' in claim 2 of the patent in suit fails to differentiate in terms from the structure shown in Fig. 8ª of the British patent under consideration. In said figure the flanges project outwardly of the metallic rim, and they are at an angle to the plane of the wheel so as to form a channel or groove having tapered or inclined sides. I therefore find in the said Fig. 8ª of the British patent a complete answer in terms to claim 2 of the patent in suit, with the single

exception of the reinforcing strip of fibrous material at the bottom of the tire and wholly within the flanges, which was old in the Desparre patent, as I have hereinbefore pointed out, and the addition of which to the tire of this British patent would not, in my opinion, involve a scintilla of invention.

"It is, and always has been, the rule of the Patent Office in passing upon the claims of applicants for patents to construe a claim as broadly and comprehensively as the language of the claim will warrant without doing violence to the usual and accepted meanings of the terms employed; and if, tested by this rule, a claim is not distinguished from a prior art structure, the applicant is required to so change the language of the claim as to make it impossible of reading upon the prior art structure; and this no matter how far apart in substance the structure sought to be defined by the claim and the prior art structure may be. In my own experience in the Patent Office I frequently had occasion to advise an applicant that one or more of his claims was 'met in terms' by a prior art structure; not meaning thereby that the subject-matter of the claim was necessarily unpatentable over the prior art structure, but that the language employed in definition was too comprehensive and sweeping, and must be reformed so as to be incapable, in its widest significance, of application to the prior art structure. If my interpretation of the terms of the claims of the patent in suit, as above given, is correct, these claims violate the rule above referred to.

"But even if, as appears to have been the case in the litigation thus far over this patent, the claims be given the benefit of a narrower construction than the plain meanings of their terms imply, and be interpreted as covering only a form of channel in which the flanges or

side walls lean outwardly of the channel, the only change necessary in Fig. 8[a] of the British patent under consideration to maintain the anticipating effect of said figure is to incline the side walls outwardly relatively to the channel and correspondingly vary the inclination of the sides of the inner or base portion of the tire to fit the same in the manner shown, for instance, in Fig. 30 of the British patent No. 18,030, granted to the same patentee. To do this would not, in my opinion, involve anything higher in the way of an intellectual effort than is represented by the ordinary and expected skill and judgment of the mechanic familiar with this art. The prior art as thus far considered by me shows that long prior to the entry of the patentee Grant into the field, the particular cross-section of channeled rim to seat the tire was simply a matter of selection and choice. The rim having inwardly turned side walls or flanges had a clinching effect on the base of the tire, and held the latter more securely against radial displacement; but, on the other hand, it was more difficult to get the tire into its seat. The rim having outwardly leaning side walls or flanges afforded more facility for getting the tire on and off, and was not as hard on the tire in point of wear and abrasion, but required more in the way of fastening devices to keep the tire in place in service. The rim having a rectangular channel was a compromise between the two, sharing in a measure the advantages and disadvantages of both. This patentee Willoughby, in the two patents under consideration, discloses all three of these forms, with tire bases shaped to fit all forms. For instance, in Fig. 8[a] of No. 5,924, he shows the inwardly turned form; in Figs. 15, 17, 26, 30 and 31, of No. 18,030, he shows the outwardly turned form; and in Fig. 7[a] of No. 5,924, and Figs. 21, 22, 23, 24, 25, 27, 29, 32, 33 and 34 of No. 18,030,

he shows the intermediate or rectangular form."

Counsel for the Grant patent, in one or two of the other litigations represented by the exhibit records, have attempted to meet these Willoughby patents by the contention that the retaining wires of Willoughby, with their one or two intermediate coils for securing a certain amount of resiliency are not the retaining wires of the Grant patent, because the enlargement of the Willoughby retaining wires would make it difficult to thread the wires through the openings in the solid rubber tire, and when there would tend to abraid the wire in actual use. A complete reply to this suggestion is found in the Grant patent itself and in Grant's testimony, to the following effect: The Grant patent shows that exactly the same protuberances appear in the retaining wires of the Grant patent, as shown in Fig. 3, and shows an enlargement of the wires at the place of uniting the same, substantially as shown as to size and location in the Willoughby patent. Grant also in his deposition described, as one of the methods of uniting the two ends of the wires, by twisting them together, making, as he says, an enlargement necessarily twice the size of the wires. (Rec., p. 634, Q. 20.)

As we have seen repeatedly in this record, and in Grant's testimony and the testimony of the above witnesses, the rubber of the tires continually crept in the earlier tires, and of course by creeping passed over these enlargements in the wires at the united ends. From Fig. 3 of the Willoughby patent it

does not appear that there is more than one enlargement by the coil of the wire in each of Willoughby's retaining wires, and probably one would be sufficient for the purpose desired by Willoughby. The proposition is then self-evident that no distinction could be drawn between Willoughby and Grant by reason of these enlargements in the retaining wires.

We herewith, for convenient reference of the court, reproduce the figure drawings of the Willoughby patents, as identified by Mr. Pond in his deposition, also the drawing of Fig. 3 of the Willoughby patent No. 5,924—the drawings speaking for themselves. The drawings of the two Willoughby patents just referred to are more fully identified as follows by the reproduction from the cuts of the Willoughby patents themselves. The patents themselves being found respectively in Book of Old Patent Exhibits, pages 140-148.

The drawings of the Willoughby patent of March 26, 1892, No. 5,924, as to the flanged channel, show the flanges in three different positions as to the solid rubber tire. Fig. 8 shows the flange at right angles of the rim; Fig. 8^a shows the flanges somewhat inwardly inclined with the two retaining wires, and Fig. 7^a shows the flanges vertical with two retaining wires, the retaining wires in Fig. 8^a being below the outer periphery of the flanges, and the two retaining wires of Fig. 7^a being centrally located, as to their openings, with the periphery of the flanges. In Fig. 6, however, which is a pneumatic tire (a tire when highly inflated, is as solid

as a rubber tire), the flanges are outwardly flaring and the two retaining wires are substantially below the periphery of the flanges.

FIG. 3

FIG. 6.

FIG. 7a.

FIG. 8.

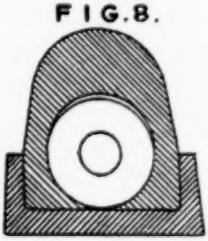


FIG. 8a.

Willoughby March 26, 1892, English Patent.
Figs. 3, 6, 7a, 8, 8a.

When we turn now to the Willoughby October 10, 1892, patent, No. 18,030, we find in addition to the right angle flanges upon the rim, and illustrated,

five in number, the precise outwardly flaring flanges of the Grant patent, and in five of the figures shown are the two retaining wires of the Grant patent; one of these figures showing the retaining wires above the periphery of the flanges, another substantially on a line with the periphery of the flanges, and three of the figures showing the retaining wires substantially below the periphery of the respective flanges. We herewith reproduce these figures in confirmation of this statement:

FIG. 15.

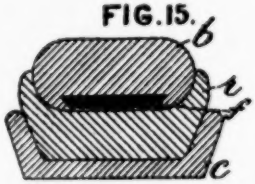


FIG. 17.

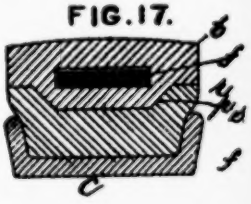


FIG. 26

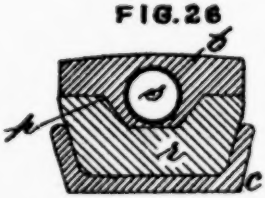
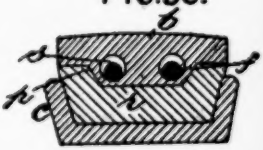


FIG. 30.



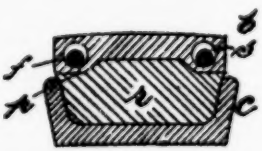


FIG. 31.

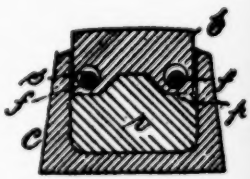


FIG. 32

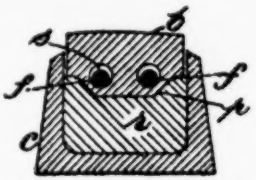


FIG. 33.

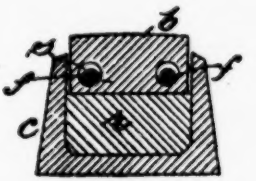


FIG. 34.

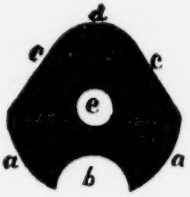
WILLOUGHBY OCTOBER 10, 1892, ENGLISH PATENT.
Figs. 15, 17, 26, 30, 31, 32, 33 and 34.

It is a curious and significant fact also, that if any party should really desire a lifting or tilting action in these tires of the Willoughby and Grant types, the only way to affect the same would be to put a resilient coil in the retaining wires, so that the wires could yield by the resiliency of the coils upon a sufficient force applied in any way, either sidewise or endwise, to remove the tire from the rim.

It may be of interest in this connection to call the attention of your Honors, as illustrative of the entire absence of inventive thought or conception in this Grant patent, two or three of the old patents, illustrating solid rubber tires, even as to the particular outlines and configuration of angles and relation of angles so minutely described in the Grant patent.

Coop's British and American Patent No. 20,678, 1891.

This patent shows a solid rubber tire with a central opening or space that could be utilized for a single retaining wire. This tire placed in one of the outwardly flaring rims of Willoughby would meet every suggestion of Grant, as is apparent by the following cut taken from the Coop's patent (page 2, Book of Old Patent Exhibits):



Owen Patent No. 365,091 of June 31, 1887.

This patent shows several forms of solid rubber tires in outwardly flanged rims, of substantially the peculiar construction of Grant, and if you thread these old retaining wires through openings in these peculiar shaped tires, as in Grant, you will have the Grant patent, which can be seen simply at a glance at Figs. 5 and 6 of the Owen patent, page 44, book of "Old Patent Exhibits," here shown:

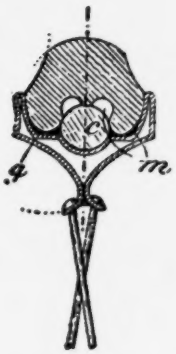


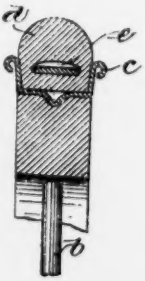
Fig. 5.

Fig. 6.

Elliott Patent No. 440,702 of November 18, 1890.

This patent shows a solid rubber tire in an outwardly flanged rim, but with a central retaining band, located below the periphery of the flanges, to hold the tire in place, instead of two retaining wires. This fact is evident by an inspection of Fig. 2, here shown, of the Elliott patent in the book of "Old Patent Exhibits," p. 66:

Fig. 2.



Blosser & Kunkle Patent No. 529,474 of November 20, 1894.

This patent shows flanged rims both at right angles and flaring. A solid rubber tire located therein with two independent retaining tires. It is true in this patent that the retaining wires are located in openings not on a line with the periphery of the flanges, but closely approximating the base of the tire, and that the angles of the solid rubber tire are substantially different from those described in Grant, but there are no differences between Grant and Blosser & Kunkle except these angles. We believe that the attorneys for Grant claim that in one of the other litigations Grant attempted to swear back the date of his invention beyond the date of the application for this patent. This Blosser & Kunkle patent is found on page 96 of the book of "Old Patent Exhibits."

Welch British Patent No. 14,563, September 16, 1890.

This patent shows several forms of solid rubber tires held by retaining wires, with two independent retaining wires holding the tire in various forms to the channel rim, illustrated in drawings on page 124 in the book of "Old Patent Exhibits." Figs. 2 and 6 are here reproduced:

Fig. 2

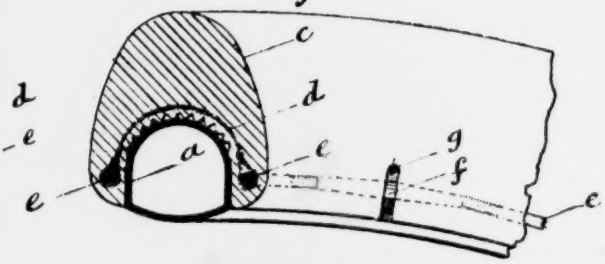
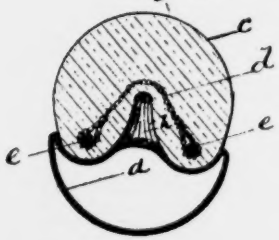


Fig. 6.



Other patents could be enumerated, but these have been given and illustrated simply to show that at the time Grant entered this field in the manner shown and patented, there was nothing left for him to invent or disclose beyond that which had been fully illustrated, shown and described in the prior art, except as to wholly unimportant detail of exact angles.

We turn now to the second defense to this action, namely:

The Grant Patent Rightly Construed, the Petitioning Defendant Does Not Infringe.

While it may be true that in the antecedent litigations over this Grant patent in the Second and Sixth Circuits, the defendants in those cases used the precise and exact device, as to configuration, angles and proportions of this Grant patent, used the same mold, and therefore by so doing may have, of necessity, infringed the patent; still, in this action, this patent closely analyzed as here presented and as construed, as here contended for, if to be confined to exact angles and relations of angles and precise configuration of parts—so construed—the petitioning defendant's device here present as introduced by the complainant respondent, the Consolidated Company, does not infringe. It may be that, to a certain extent, the aid of calipers and a magnifying glass are necessary to so find, but such instruments are also necessary to find from said patent any semblance of difference and distinguishment from the old art. We adopt in this connection and here quote in full from the testimony of petitioning defendant's mechanical expert witness, Mr. Pond, as to this matter of non-infringement, who handles this question as a question of fact. The testimony of Mr. Pond is somewhat extended as to this fact of non-infringement, for the reason that Mr. Pond gives accompanying reasons for his statements somewhat fully, but the reasons found, clearly substantiate the statements made. The construction of this Grant patent is, of course, a question of law for your Honors, but if your Honors shall con-

strue this Grant patent as here contended for, we believe your Honors will find that the fact of non-infringement of either claim of the patent must necessarily follow from such construction, and for the reasons given in the deposition of petitioner's mechanical expert, and we leave this question of non-infringement with this presentation, and with the further reason of the recognized rule of law laid down by this court to the effect that the burden of proof to establish infringement rests upon the complainant. Mr. Pond's deposition is found on Rec., pp. 171-8, and reads as follows:

"A. I will first consider the smaller exhibit, 'Section of Diamond Rubber Company Tire,' which apparently is a section cut from the periphery of the larger exhibit, marked 'Complainant's Exhibit Defendant's Rubber Tire.' I find in this exhibit the three fundamental mechanical elements of a solid rubber tire, a channel rim and a pair of retaining wires which I find in the Grant patent in suit, and which, as I have already pointed out, were borrowed by the patentee Grant, both individually and in combination, from the prior art long antedating his alleged invention. Considering first the rim, I find a considerable difference between its specific structure and the specific structure of the tire of the patent in suit. In the rim of the patent in suit the side walls or flanges diverge at a considerable angle from the vertical, being about twenty-one degrees by actual measurement; and both the inner and outer walls of the side flanges thus diverge, being substantially parallel. The side flanges of the defendant's rim are of different form and divergence. The inner walls which lie next to the tire exhibit a divergence of less than ten degrees from the vertical, while their outer walls are rounding or

convex, and, throughout their upper or outer halves, lean inwardly of the channel at an angle of about ten degrees. The mean radial line of the flange in defendant's channel is about perpendicular or normal to the base of the channel. Hence, it cannot be said of the defendant's channel that 'these flanges *b'* extend outwardly from the rim *b* at an angle,' as the complainant's tire is described in the specification of complainant's patent. Furthermore, the inner walls of the side flanges of the exhibit of defendant's tire which I am considering are slightly hollowed or concaved in cross-section, whereas the corresponding walls in the patent in suit are straight.

"Considering next the form and structure of the tire itself, I also find several differences between the tire of the patent in suit and the tire of the exhibit under consideration. The tire of the patent in suit has on its outer or exposed portion straight sloping sides (in cross-section) fully twice the length of the oppositely sloping or inclined sides of the base portion of the tire, and forming an angle of 137 degrees with the latter, by measurement. The defendant's tire has on its outer or exposed portion much shorter approximately straight sloping sides but slightly longer than the sides of the inner or base portion and formed at an angle of 162 degrees with the latter, by measurement. Furthermore, I do not find in the sample of defendant's tire under examination any clearly defined angle or meeting point between these inner and outer sides, as in the complainant's patent. In the molding of the tire of the exhibit of defendant's construction there appear to have been formed at the junction of these outer and inner sides small ribs or fins which appear to have been smoothed or planed down more or less at various points, forming at such cross-sectional points short radial lines connecting the oppo-

sitely sloping lines marking the cross-section of the inner and outer portions of the tire. The effect of this is to make these inner and outer lines that define the cross-sectional form of the sloping sides of the inner and outer portions of the tire practically continuous, so that it is impossible to say where the corner or angle between them is located or whether it exists at all. Of course, the fact that both the inner and outer sides of the tire in the defendant's structure much more nearly approach the vertical or radial line of the tire makes the obtuse angle between them much larger and nearer the vanishing point than in the case of the complainant's patent in suit.

"In the patent in suit the openings or holes through which the retaining wires pass are shown and described as 'formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b'.' Insofar as I am able to locate the angles or corners on the sides of the section of defendant's tire introduced in evidence, I do not find that this is at all correctly descriptive of the latter. The openings for the wires in defendant's tire are apparently not more than half within the inner or unexposed portion of the tire, their upper or outer halves lying within the outer or exposed portion of the tire. Neither do I find that the tops of these openings in defendant's tire 'stand below the outer periphery of the flanges,' but are just about on a line connecting the outer peripheries of the flanges.

"In both complainant's patent and the exhibit of defendant's tire under examination, I find a strip of canvas on the base of the tire and extending partly up on the unexposed sides of the tire.

"Having thus pointed out such similarities and differences as I find between the Grant patent in suit and the section of defendant's tire which I have examined, I will turn to the claims of the patent in suit and compare these with the exhibit 'Section of Defendant's Tire.' Preliminary to this however, I may say that I find no substantial differences between the larger exhibit, 'Complainant's Exhibit Defendant's Rubber Tire' and the smaller exhibit 'Section of Diamond Rubber Company Tire,' which, as above stated, apparently has been cut out of the first and larger exhibit. The excised section appears to be a fair and accurate representative of the complete exhibit from which it is taken. In comparing the claims with these exhibits, I shall consider the claims at their face value, and without attempting to place any construction or interpretation upon them in respect to scope beyond such as I think was clearly intended by the patentee.

"Considering first claim 1, I note that the claim is addressed to and covers a complete vehicle wheel; and the first element recited in the claim as a part of said wheel is 'a metallic rim with angularly projecting flanges to form a channel or groove with tapered or inclined sides.' As I have already pointed out, this description of the rim is somewhat vague and indefinite. The description does not disclose with what the projecting flanges form an angle; nor does it disclose whether the taper or inclination of the sides of the channel leans inwardly or outwardly of the channel. Assuming, however, that the drawing and specification of the patent explain what is meant by this description in the claim (since it is the function of drawings and specifications to explain and clarify ambiguities and uncertainties in the claims), the matter above quoted from the claim refers

to a metallic rim having side flanges which lean outwardly of the channel at an angle to the plane of the wheel. I do not find in the exhibits of the defendant's tire offered in evidence a metallic rim completely responsive to this definition. In the defendant's wheel the rim has substantially radially projecting flanges which, considered as a whole, are substantially parallel with the plane of the wheel; each of these flanges having an inner wall that leans slightly outwardly of the channel and an outer wall that leans to about the same extent inwardly of the channel. In order to make this element of the claim readable upon the defendant's tire as well as upon the tire of the complainant's patent, it would be necessary to change the reading of this element in the claim somewhat as follows: *A metallic rim with flanges the inner or tire-engaging walls of which are tapered or inclined so as to lean outwardly of the channel.* I do not find, however, such a definition of the rim in the claim.

"The second element of the claim is 'a rubber tire;' this element is limited and qualified to the exent that its inner portion 'is adapted to fit in said groove or channel' and its outer portion has 'sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges.' In the exhibits of the defendant's tire submitted there is a rubber tire having inner and outer portions; but I do not find that the inner portion either fits or is adapted to fit the groove or channel of the rim. The inside width of the channel of the rim in the exhibits of defendant's tire is fully an eighth of an inch wider at all points than the width of the base of the tire, which would permit such an extent of lateral shifting and wobbling of the tire in the rim and such an easy accumulation of dirt and other deleterious mat-

ter between the tire and the rim as to make the tire practically useless in service. As to whether or not in the defendant's tire the sides of the outer portion form an angle with the sides of the inner portion, and whether or not such angle or corner is located 'within the outer periphery of the flanges' it is difficult to determine. At some cross-sectional points on defendant's tire there appears to be an ill defined angle or corner, and at other points there are two such ill defined angles or corners with a short radial line between them. Insofar as I can locate these angles or corners they appear to vary on defendant's tire between a point substantially opposite the outer periphery of the flanges and a point slightly inwardly of the outer periphery of the flanges.

"The final element of the claim is defined as 'independent retaining wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges.' Defendant's tire has independent retaining wires; but they do not pass entirely through the inner portions of the tire. They clearly intersect the line between the inner and outer portions; lying partly in the inner portion and partly in the outer portion. As regards the location of these wires relatively to the outer peripheries of the flanges, they appear to be just about tangent on their outer sides to a line drawn between and connecting the outer peripheries of the flanges.

"While, therefore, I find in the exhibit of defendant's wheel and tire in evidence the three mechanical elements of claim 1 of the patent in suit, I do not find any or all of these elements possessing the limitations of structure and relative relation to each other as specified in the claim; and hence I do not find the alleged invention and device of the patent in suit as defined in claim 1 thereof to be present in the exhibits of the defendant's construction in evidence.

"Referring to claim 2 of the patent in suit, this claim is also addressed to and covers a complete vehicle wheel; and the first element of the wheel structure as recited therein is 'a metallic rim with outwardly projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides.' This is a slightly more specific definition of the flanges than is contained in claim 1, and yet it is not entirely free from uncertainty and ambiguity. The flanges are defined as to location as 'at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides.' Obviously this definition applies with equal accuracy to a construction in which the flanges lean inwardly of the channel as, for instance, in Fig. 8[a] of the Willoughby British patent No. 5,924 of 1892. As to 'outwardly projecting,' the claim does not state whether the flanges project outwardly relatively to the rim itself, or project outwardly relatively to the plane of the wheel. However, this definition of the flanges is, in my judgment, equally inapplicable with the definition of claim 1 to the flanges of the defendant's structure, and would require the same modification to make it readable upon the defendant's structure as suggested in my discussion of claim 1.

"The definition of the second element of the claim, 'rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges' is substantially the same in substance and scope as the definition of the same element in claim 1, and does not apply to the defendant's structure for the reasons already stated in the comparison of claim 1.

"The third element of the claim is 'openings extending entirely through the unexposed por-

tion of said tire.' Strictly and technically speaking, an opening, having no material or tangible existence, does not and cannot constitute a mechanical element in a combination; but what the claim means, evidently, is that the tire is provided in its unexposed portions with openings extending entirely therethrough, which feature is, of course, necessarily a feature of claim 1 also. I do not find that in the defendant's structure these openings (for the retaining wires) extend entirely through the unexposed portion of the tire, being located partly in the unexposed portion and partly in the exposed portion of the tire.

"The fourth element, 'independent retaining wires in said openings,' and the fifth element 'a reinforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges,' I find to be present in the defendant's construction.

"While, therefore, as regards claim 2 of the patent in suit, I find in the defendant's construction the three fundamental elements, taken from the prior art, on which the patentee Grant has built his alleged invention, I do not find in the defendant's construction the first, second and third elements of claim 2 of the patent in suit in the form and relative arrangement as defined in said claim, and hence I do not find in the defendant's construction the subject-matter of said claim, considered as an entirety.

"Briefly summarizing my conclusions, for the reasons above given I do not find the alleged inventions, combinations and devices of either of the claims of the Grant patent in suit embodied in or contained in either of the exhibits introduced in evidence professing to represent the defendant's tires."

The diametrically opposite findings and conclusions between the Circuit Court of Appeals of the Second Circuit and the Circuit Court of Appeals of the Sixth Circuit, as shown by the respective opinions.

FIRESTONE CASE, SECOND CIRCUIT, 157 F. R. 237.

The Circuit Court of Appeals in the Second Circuit, in the Firestone case, made the following statements relating to the Grant patent and tire:

> "The Grant tire has the capacity which no other possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber, or injury to any of the parts."

The court, further along in its opinion, says:

> "It now appears that the feature which secures patentability is inherent in the patent, and the specification is so clear and specific that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature is neither an accident nor an obscure property; it exists in every wheel on which is mounted a tire which follows the teachings of the patent. * * * The specification is addressed to those skilled in the art; it is enough that they understand it.
>
> * * * * * *
>
> "That the capacity for readjusting itself when subjected to lateral strain is inherent in the Grant tire, seems perfectly plain and was demonstrated at the argument even by hand pressure applied to the tire at a point where the rubber had been cut down so as to expose the wires."

GOODYEAR CASE, SIXTH CIRCUIT, 116 F. R. 363, 123 F. R. 85.

The Circuit Court of Appeals of the Sixth Circuit, in the "Goodyear case," speaking upon this precise subject matter, even as to detail, says, referring directly to the alleged tipping capacity of the Grant tire:

> "Oddly enough, the new mode of operation to which the novelty of Grant's combination is attributed is not mentioned in the specifications, and its discovery is due to the keen optimism of professional experts.
>
> * * * * *
>
> "That this capacity for side tipping or lateral movement under violent lateral strain, is an operative function inherent in the particular arrangement of the old parts constituting Grant's combination, is dependent wholly upon expert opinion. Its actual presence, from practical experience or observation, is not shown. Neither are the experts able to deduce this function from the instructions of the patent concerning the construction of the wires, for the patent is silent in respect, not only as to the function itself, but as to the proper tension of the wires in order to obtain it beneficially.
>
> * * * * *
>
> "The specification gives no hint of this alleged joint action of all the parts to produce the tipping action, or of the advantage therefrom in preventing the tearing or cutting of the rubber from the wires. If this capacity for side movement be a beneficial function, plainly inherent in Grant's combination and arrangement of old parts in relation to each other and not a mere 'obscure property lurking in some accidental corner of the device,' it was not essential that the patentee should point it out as one of the advantages of his structure.
>
> * * * * *

"But this is not so in respect to the undescribed function of the Grant device, for he neither mentions any such capacity, nor describes any such arrangement of his retaining wires as will secure a capacity for 'rising or yielding' under lateral strain as a necessary result of the tension so provided for. The problem, so far as the public is concerned, is to remain a problem.

* * * * *

"We learn now that this capacity for any beneficial yielding is dependent upon the wires being properly adjusted originally, and that this proper tension depends upon the right adjustment by the workman. If this tipping capacity had been pointed out and even this indefinite direction given by the patentee, as to the mode of securing the operation, the patent might possibly be saved, though this we need not consider. But neither the advantage of such a function nor any hint that it is in any wise dependent upon the normal tension of the retaining wires is to be found in the patent.

* * * * *

"Grant has not disclosed this alleged capacity of his structure for 'rising or yielding' on one side under severe lateral strain, nor has he disclosed any method of securing the same by the proper arrangement of the retaining wires to produce the proper tension upon which this capacity, in any beneficial sense depends."

Really no substantial difference between the testimony in the "Goodyear Case," and the testimony in the "Firestone Case," as to the presence of this alleged "tipping capacity," in the Grant patent, and tire.

In reading the opinion of Appellate Court in the "Firestone case" it would seem that that court had taken it for granted that in the "Goodyear case"

there was no statement of facts, as to the presence of the tipping capacity in the Grant patent and tire, but that such tipping capacity, as to any fact before the court, resided solely in the "keen optimism of the professional expert." This was an error upon the part of that court in the "Firestone case." *Of course it would seem to be axiomatic that this tipping capacity,*--"the feature which secures patentability is inherent in the patent, and the specification is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action, which inheres in no other tire,"—*that if this statement is true, as asserted by the Appellate Court in the Firestone case, it must have, of necessity, been equally true in the Goodyear case.* The opinion in the "Firestone case" stated that the "capacity for readjusting itself, when subjected to severe lateral strain, is inherent in the Grant tire, seems perfectly plain and was demonstrated at the argument, even by hand pressure applied to the tire at a point where the rubber had been cut down so as to expose the wires,"—if this "tipping capacity is inherent in the tire," and "perfectly plain," then, of course, this capacity was not as apparent in the Goodyear case, as in the Firestone case, and the two records are identical upon this point. An examination of the record in the Goodyear case shows also that the testimony in that case, as appears in the deposition of the patentee Grant, and of his expert Livermore, the same witness and expert quoted from in the opinion of the Court of Appeals of the Second Circuit, in this case, that such witnesses testified clearly and unequivocally that the Grant tire had the capacity to tilt and reseat itself whenever receiving a severe side strain.

The Patentee Grant Testified in the "Goodyear Case" Upon This Point.

Upon June 15, 1905, the patentee Grant in the Goodyear case, as shown in the "Exhibit Goodyear Record," testified emphatically and clearly upon this point, as follows:

> *"It would fill the channel so as to leave no space for the gathering of dirt or gravel, but still by employing this particular shape it would allow the tire to readily and easily reseat itself whenever receiving a severe side strain, which is the peculiar construction of the tire it was my intention to have it do, that is to say, have it so that it would ease or relieve itself whenever receiving severe side strain, and still immediately reseat itself."*

The patentee Grant, himself, in that deposition did not seem to be at all positive, in fact, directly otherwise, that his patent gave any intimation of this function or tipping capacity. Upon cross-examination as to this particular point, in the Goodyear case, Grant testified as follows:

> "X-Q. 28. But your patent does not say anything about the rubber moving sidewise in the channel, or tipping sidewise so as to partially leave the channel and then reseat itself, does it, as you stated the tire does?
>
> "A. I think not.
>
> "X-Q. 29. Do you know that your patent does not contain any such statement?
>
> "A. I do not know that it does. I have read it over several times and never saw any such statement."

The Testimony of Complainant's Expert, Livermore, Goodyear Case.

The complainant's expert Livermore testified in a dozen different places, in his deposition in the Goodyear case, that the Grant tire has the capacity to rise and fall and reseat itself under lateral strain. The exact language appearing in one or two of the statements when speaking of this alleged function of the Grant tire and patent to tip and rise and fall and reseat itself, is as follows:

> "That is, it consists in permitting the tire to rise slightly from the rim on one side, independent of the other, when subjected to very great strain, and immediately reseat itself when such strain is removed." (Goodyear Rec., p. 274.)

Again, this expert Livermore says:

> "The specific form of rubber affords a broad, firm support first at the bottom of the channel and sidewise with the flanges of the channel while permitting the rubber to rise in the channel at either side, when required." (Goodyear Rec., p. 275.)

Complainant's expert in the Goodyear case occupies over a printed page stating and giving his opinion as to the evident function of the Grant tire to rise and fall and reseat itself under severe use and lateral strain in travel. (Goodyear Rec., pp. 278-9.)

We do not understand that in the "Firestone case" the testimony of the complainant in that case, upon this point, as to facts stated or proven, was anything other or different from that which appeared in the Goodyear case. It is true that in the "Firestone case" there was set forth in the testimony of a witness by the name of "Krotz," in be-

half of the complainant, a so-called test to determine the existence of the tipping and reseating capacity of the Grant tire under supposed side thrusts or strains. This so-called test was represented by a curious proceeding, or performance, with a mechanical appliance connected with a certain kind of rubber tired wheel, in which, according to the admissions of the witness Krotz, "there was no effort made whatever to tip the rubber" and the vehicle was "driven carefully."

The fallacy of the test in the Firestone case is discussed by defendant's expert witness, Pond, *inextensio*, as appears in this Record, pp. 211-219, and ample reasons given why such tests were a farce to determine any right fact as to the tipping capacity and result of the Grant tire under severe lateral strain.

Truly, then, it would seem that the records in the Goodyear case and the Firestone case were in all respects substantially alike, and that the difference between the two cases was a difference, only, as to result; and opinions of the respective courts, given therefor.

The record in this, the Diamond case; the decision of the Circuit Court of Appeals of the Second Circuit in this case.

The decision of the Circuit Court of Appeals of the Second Circuit is printed in this record (pp. 681-4 inclusive). In that opinion the Circuit Court of Appeals of the Second Circuit in this case states, in substance, that the record in this case is substantially the same as the record in the Firestone case,

and refers to the Firestone case as a justification for its opinion in this case. The opinion of the courts in this case, as in the Firestone case and, indeed, as in the Goodyear case, hinges the validity of the Grant patent upon the fact as to whether or not the asserted capability of the rising and falling of the tire and the automatic readjustment of the tire upon its normal base condition is present and inherent in the tire construction, as disclosed by the specifications. In this case (Rec., p. 682) the Court of Appeals, speaking upon this controlling proposition, as present and proven in this case, states as follows:

> "The tests made in that case convinced us that this tendency actually existed and that we were safe in assuming as established, a proposition about which the experts on both sides agreed and the truth of which was demonstrated in open court.
>
> "The impossibility of proving or disproving in any satisfactory manner the existence of this tipping tendency by the observation of the vehicle in actual use or the examination of a worn out tire, will be admitted after a moment's reflection. The human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction at an angle of 45 degrees. So, too, a worn out tire with cuts and abrasions along its entire periphery may have the tipping capacity in question. The fact that tires have been produced in court which were rusted in the steel channel, is not important unless it be proved that they were subjected to severe lateral strain."

The writer of this brief desires to be as polite as possible, but also as positive and emphatic as possible in protesting against, repudiating, and combating and exposing the errors of the Court of Appeals

in this case, as to the statements upon this particular subject matter, disclosed in the opinion of these Courts of Appeal in this case and in the Firestone case. The opinions disclose three statements of fact, that can be briefly epitomized as follows, in the exact language of the opinions or slightly transposed:

I.

"The Grant tire has the capacity which no other possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber, or injury to any of the parts."

II.

"The feature which secures patentability is inherent in the patent and the specifications, is so clear and specific that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire."

III.

"The impossibility of proving or disproving in any satisfactory manner, the evidence of this tipping tendency by the observation of the vehicle in actual use, or the examination of a worn out tire, will be admitted after a moment's reflection."

How any court of mature judgment could have made these statements in the face of the record here present, is beyond the ken of the writer of this brief, and we shall now proceed to show to your Honors the absolute impossibility of the correctness of these statements, and the absolute error of every statement made, from the abundant and uncontradicted testimony of the record in this case. *This record is not the same record as in the Firestone case.* This record is absolute confirmation of the truth of every

statement and conclusion, and every line of the opinion, of the Circuit Court of Appeals of the Sixth Circuit, and we bespeak for the record depositions of petitioner in this case, a consideration and understanding, manifestly absent from the consideration of the Circuit Court of Appeals of the Second Circuit in this case.

The Record in This the Diamond Case.

We propose now to present to this court and discuss the record as now presented in this case. The petitioner, the Diamond Rubber Company of New York, had nothing to do in any way, either directly or indirectly, with either the records or the cases in the three separate litigations represented by the "Goodyear case," the "Kokomo case" and the "Firestone case," and I take it that the rights of this petitioner litigant will be determined by the record made in this case, and certainly that this petitioner is not bound, and should not be prejudiced by the record in the Firestone case. The Court of Appeals in the Firestone case, as we have seen and quoted, in speaking of the Grant tire, and relating to a question of fact, said:

> "The Grant tire has the capacity which no other possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber or injury to any of its parts."

The record in this case, by voluminous testimony of witnesses familiar with the facts, is conclusive and uncontradicted that the Grant tire, clamped to the channel or rim, by the straining tension of the

two wires, has no such capacity, never did have, and never could have. It will be noticed that this Court of Appeals of the Second Circuit states that the so-called capacity of the Grant tire of readjusting itself and yielding to severe lateral strain is a capacity that is evidenced by and proven by the fact that a tire so constructed when subjected to severe lateral strain will do so *"without tearing or abrasion of the rubber or injury to any of the parts."*

It is entirely manifest that this question can be easily determined as a question of fact. If upon the examination of the tires of the Grant patent when used and after being subjected to "severe lateral strain" they were without any evidence of "tearing or abrasion of the rubber or injury to any of the parts," then the demonstration would be quite conclusive that, although Grant said nothing about these characteristics, or qualities, of his combination, and, indeed, as we shall show hereafter from the record in this case, not only said nothing about them, but knew nothing about them, and had no suspicion of their existence, then the statement of the court would be to a certain extent a correct statement as to the Grant tire, *although a statement that found no sanction or justification in the patent, and was equally present in several of the tire patents of the old art;* but the record in this case shows that the tire of the Grant patent, under "severe lateral strain," not only constantly produced abrasions of the rubber, but, as a matter of fact, finally injures and destroys the tire practically always before being worn out, and frequently before the utility and usefulness of the wearing surface

or tread of the tire has been affected to any extent, *one of the first original records showing that no such capacity existed, or was asserted to exist, in the Grant tire or patent is here present.* The testimony in this record showing these facts is as follows:

Upon pages 477 to 576 appears in printed form certain certified copies of original testimony taken in the case of this complainant, *The Rubber Tire Wheel Co.* v. *Firestone Victor Rubber Tire Co. et al.*, in the case then pending in the United States Circuit court for the Northern District of Illinois upon this Grant patent, in the year 1897 or the year following the grant of the patent. This patent was then but something more than two years old, and evidently at that time neither this complainant nor the patentee Grant, nor their counsel, had discovered this automatic capacity of the Grant tire to readjust itself by yielding when subjected to "severe lateral strain" and "without tearing or abrasion of the rubber or injury to any of the parts."

Defendant's counsel in that case, as shown by the record, certainly had no suspicion of any such capacity, and to show the questionable position of the then and now complainants-appellees as to there being any substantial virtue or value in the Grant patent over the other solid rubber tires then in the market and in use, took a considerable amount of testimony to show the precise character, as to wearing qualities, of this Grant tire as then sold in the market, and used in the two principal cities of the country, New York and Chicago. The testimony in

that case was given by the then leading carriage builders and liverymen in the cities of New York and Chicago, and the depositions of all of these witnesses was to the effect that the Grant tire of the patent in suit, as made by The Rubber Tire Wheel Company, a complainant in this case, not only tore in use, with destructive abrasions of the rubber, but the tire was so injured as to its parts by cutting out from the wires that it was destroyed in use before its capacity and usefulness as a tire otherwise had been affected.

Mr. JAMES W. PITNEY, ten years ago a leading carriage maker for thirty years in New York City, and a livery stable keeper for about twenty years (Rec., 482), testified, ten years ago, as to this Grant tire. Mr. Pitney testified that, as to these Grant tires made by the Rubber Tire Wheel Company, which he had put on himself, that he had never known one of them to wear out in use. (Rec., 483-4.)

> "Q. 10. What happens to all of the Rubber Tire Wheel Company's tires on vehicles owned by you or in your establishment before they wear out?
>
> "A. I should call it creeping, I suppose, shifting back and forwards, tying up into a knot like and cutting right through the wire, so that to get it smooth I would have to take out eight to ten inches. They cut off at the bottom and slip off the tire entirely."

Mr. Pitney testified that he could not remember of but one instance where the tires of the Rubber Tire Wheel Company had worn out in use in distinction from being destroyed by cutting. (Rec., 484; Qs. 12 and 13.)

Mr. SAMUEL LAWSON was a half owner of the Irvin stables in New York City. (Rec., 490; Qs. 1 to 5.) This witness, in 1898, had used the tire of the complainant in his business for about four years. (Rec., 491; Qs. 13 to 16.)

"Q. 17. What, if anything, happens to these tires in use?

"A. Well, I tell you what I find in them, they cut through; and the rubber becomes loose of course.

"Q. 18. Whereabouts on the tire do they cut through?

"A. Where the wire passes through to hold them on.

"Q. 19. Do they cut through at the sides or at the bottom of the tire?

"A. I have had the wire come through the sides; most frequently through the bottom."

Mr. Lawson testified also that he never knew of but one instance where a set, or even one tire, was worn out by use, before it was destroyed by cutting out through the wire. (Rec., 493; Qs. 22, 23 and 24.)

Mr. WILLIAM SEAICH, in the year 1898, or ten years ago, the leading liveryman in the City of New York, with his place of business at Nos. 40 and 50 East Thirty-second street, this city, for forty years (Rec., 497-8; Qs. 1 to 5), testified that he had then used for three or four years the solid rubber tires of the complainant on all of his different kinds of vehicles, about 125 in number. (Rec., 499; Qs. 10 to 12.) Mr. Seaich, when interrogated as to the wearing qualities of the Grant tires, testified as follows, and gave the reasons therefor (Rec., 500):

"A. Well, I have had a great deal of bother with them in splitting in two, had some worn

very well indeed, but the majority are constantly repaired or made new.

"Q. 15. What do you mean by these tires splitting in two; at what point and in what direction do they split, and what in your opinion is the cause of their splitting?

"A. I have always been under the impression that it was caused by the wire cutting from hole and the creeping of the tires.

"Q. 16. In what direction do the wires cut from the hole, downward toward the bottom of the channel, sidewise or upwards?

"A. Run sidewise right around.

"Q. 17. Do they cut out about on the level with the top of the flange of the channel?

"A. A little below the level.

"Q. 18. Mr. Seaich, have you ever had or known of an instance of any of these solid rubber tires like this exhibit wearing out or being worn out in use by the wearing away of the rubber on the tread or exposed surface of the tire before the tire was destroyed by the cutting out of the wires as you have described?

"A. Yes, sir, I have in two or three instances only. They wore to the top of the tire in two different instances; that is all I can recall to my mind.

"Q. 19. Do you personally look after such details of your business as is represented by your application and use of these rubber tires?

"A. My attention is called to each and every one of them."

Mr. Edward Francis Delaney. Ten years ago, or in the yeear 1898, this witness was one of the largest proprietors and operators of public hacks in the City of New York, and the sole proprietor. (Rec. 505; Qs. 1 to 6.)

This witness testified that for several years he had used the rubber tires of the complainant, the

Rubber Tire Wheel Company, and used no other kind. (Rec., 505-6; Q. 8.)

Mr. Delaney testified to the destruction of the Grant tire by cutting, abrasion and destroying the tire before being worn out, as follows:

"Q. 9. What, if anything, happens to these rubber tires in use so that you have to take them off or quit using them?

"A. The wire pulls through.

"Q. 10. Pulls through where?

"A. Through sideways and through the bottom.

"Q. 12. Are the tires any good after the wires are cut out or pull through the sides of the bottom?

"A. No, sir, they are no use at all.

"Q. 13. Have you ever had or known of a case or instance where the tire itself wore out before it was destroyed by being cut through at the sides or bottom?

"A. They never wear out altogether. It is impossible for them to wear out altogether.

"Q. 14. Do you mean that the tires are always destroyed by the wires cutting out the sides or bottom before they are worn out?

"A. They have always been destroyed with the exception of one or two cases."

Mr. Frank P. Stone of Chicago, in the year 1898 the second or third on the list of extended users of the Grant tire, in Chicago (Rec. 515; Q. 5), and who then did the largest business in the manufacture of high class carriages in Chicago (Rec., 519; X-Qs. 28 and 29), testified that he had kept watch and track of the rubber tires of the complainant to see in what manner they wore out or were destroyed in actual use, in Chicago (Rec., 515), and gave his reasons therefor, as follows (Rec., 516):

"Some of the wires holding the rubber onto the channel tire would cut their way down through to the channel—the bottom of the channel. Some would cut through the side. I think that is all."

* * * * * *

"The oscillation of the vehicle when in motion seemed to draw the rubber of the tire to either side of the channel, causing the tire to break or give away at the outer edge of the channel."

Mr. Stone was interrogated as to what proportion of complainant's tires were destroyed in use, by cutting at the upper edge of the channel. He could not state as to what proportion of such particular form of destruction took place, but said it was quite frequently, in comparison with the wearing down of the tires to the channel. (Rec., 516; Qs. 10 and 11.)

Mr. C. O. Harz, the largest owner and liveryman and operator of cab and boarding stables, ten years ago, in Chicago, at 505 Dearborn avenue, in that city (Rec., 528; Qs. 1, 2, 3), testified at that time that for three or four years he had used the solid rubber tire of the Rubber Tire Wheel Company, complainant, sold him by this complainant, and had some eighty cabs or vehicles equipped with complainant's tires. (Rec., 528; Qs. 4-7.)

This witness further testified that he did not think that any other liveryman or cab renting establishment in the city, in Chicago, had had a more extended experience than himself in the use of rubber tires, in Chicago, for four years prior to 1898. (Rec., 528-9; Qs. 9-10.)

Mr. Harz was then interrogated in detail as to the question of the destruction of complainant's tires before appreciable wear on their tread, and the reasons therefor, and he testified as follows:

"Q. 11. During the last four years have these complainant's tires worn out in the sense of being rendered useless by wear in distinction from being destroyed or made worthless in some other manner before being worn out?

"A. My argument to the people has always been that I am not wearing out your tires, but just throwing them away, for the reason that they didn't wear out on top, but continually wearing out underneath and on the sides, which, according to their promise or verbal agreement to me, should not be."

* * * * * *

"Q. 14. Have you ever in a single instance had one of the complainant's tires like this sample exhibit destroyed or made useless by the wearing out of the rubber in use, instead of the tire being destroyed by being cut out at the sides or through at the bottom?

"A. I have. One set that wore out from the top of the rubber wearing down to the level with the channel, until the wire was exposed.

"Q. 15. Is this the only instance you have ever known of complainant's tire wearing out instead of being destroyed by cutting or tearing, as you have described?

"A. The only one to my knowledge. The only one in my establishment."

* * * * * *

R-D. Q. 40 (Rec., 535):

"Is it not a fact that all of the liverymen and customers of the complainant in this city have just the same trouble and experience with the complainant's tires that you have set forth in detail in your deposition?

"A. Yes, from what I hear of these different liverymen."

Mr. WILLIAM S. ADAMS, having the largest livery plant or stable upon the South Side, in Chicago, and in business for eleven years (Rec., 535-6; Qs. 1-6), testified that he had about seventy vehicles, of other parties, and some twenty-six of his own, all equipped with solid rubber tires. (Rec., 536; Qs. 6-7.) At the time of the giving of the deposition of this witness, in 1898, he had used in the neighborhood of seventy-five or eighty sets of tires of the Rubber Tire Wheel Company, the complainant. When Mr. Adams was interrogated, in detail, as to the destruction of the tires, other than by wear, he stated as follows, in answer to Q. 11 (Rec., 537):

"A. There is the natural wear out of the tire and when I examine my tires—don't suppose there is a week but what I go through my vehicles and examine the wheels—I look along the flange of my tire—see that there is any tearing out, and of course if I see that the tire is a little torn I examine the tire close and if I find that it has had the wear and shows that it is worn out, why then I have to send it down and have a new tire put on.

"Q. 12. What do you mean by the tire being worn out that you so discover upon the examination?

"A. A tire may appear to have a rolling surface but still it may be torn out on the sides. You can see the wires through the sides of the tire along the flange and other times with this tearing out on the flange, it may be worn out on the under surface.

"Q. 13. Then as I understand you, when you examine your tires and find that they are cut along the flange and are cut next to the

channel and under surface, they are worn out as you understand and you substitute new tires therefor?

"A. Yes, sir."

Mr. Adams then gave instances as to the destruction of the complainant's tires by tearing and abrasion of the rubber and destruction by injury to the parts before any appreciable wear, as, for example, in answer to Q. 15, Rec., 538, he said:

"A. We had an experience with three landaus in three months' use the tires were sound at the sides and tore out on the bottoms."

* * * * * *

"When worn out I never saw but one set of tires that was worn out on the surface, during my experience. That was a brougham. That the bearing surface was worn right down and all the wear of that tire was shown on the surface and nowhere else."

In the case of Mr. Adams, as was frequently the case of many of the witnesses, the liverymen in those days frequently refused to pay the complainant, the Rubber Tire Wheel Company, for the tires purchased, by reason of a guarantee as to a length of time of their use, and by reason of the destruction of the tires, in the manner given, before being affected as to wear by use.

Mr. Charles F. Kimball, in the year 1898, had been in the carriage business at 315 Michigan avenue, Chicago, for twenty-two years, and was one of the largest retail dealers in the country. (Rec., 542; Qs. 1-4.) He had been familiar with the rubber tires for about eleven years, and at the date of giving his deposition had used many hundred sets

of the complainant, the Rubber Tire Wheel Company's, tires (Q. 6), and had used about double the number of any one else in the city (Q. 7).

When Mr. Kimball was interrogated, specifically, as to the manner of destruction of the tires of the Grant patent (Rec., 543; Q. 8), he said:

> "A. The English tire which we formerly used being vulcanized to quite an extent, wore down to the face of the flanges. On the present patterns of tires, the wires after a certain amount of service, either cut through the rubber sidewise or toward the steel channel before the face of the rubber is worn to the flanges, thus necessitating renewal of the rubbers.
>
> "Q. 9. Have you ever known of a single instance in the use of complainant's tire where the tire was not destroyed by cutting out at the sides or bottom before it was materially injured by wear on its tread or surface in use?
>
> "A. So far as my experience goes, all rubber tires held by wires require the renewal from cutting of the wires through the rubber, before the rubber wears down even with the face of the metal flanges.
>
> "Q. 10. Have you ever known an instance where complainant's tire has been worn out in use in distinction from being destroyed by cutting at the sides or bottom?
>
> "A. We put on hundreds of sets of tires that I do not see personally, but from those that have come under my personal observation, the wires have always cut through before the rubber wears down even with the metal flanges."

Mr. Wallace D. Moon testified that he was in the livery business in Chicago for twenty-five years, on Wabash avenue for eight years—runs about 100 to 125 cabs or vehicles with rubber tires, since 1896. (Rec., 556; Qs. 1-7.) When interrogated as to the

question of destruction of these tires, Mr. Moon testified as follows (Rec., 557-8):

"Q. 11. What, if anything, happens to these tires so that they have to be removed and replaced by other tires?

"A. They cut out either at the sides or at the bottom, one of the two. Sometimes at the side and sometimes at the bottom.

"Q. 12. Whereabouts do complainant's tires cut out at the sides?

"A. The top of the flange."

* * * * * *

"Q. 14. What was the condition of the old tires when replaced?

"A. *They were either torn out at the sides or at the bottom. They were not worn out nor half worn out.*"

Mr. Robert C. Irwin, superintendent in the repairing department of C. P. Kimball & Company for eight years. (Rec., 561; Qs. 1-5.) It will be remembered that Mr. Kimball testified as to his belief as to all of these rubber tires being destroyed by cutting out from the wires, in distinction from being worn out, but that he stated that many of the complainant's tires put on in his establishment he did not see either put on or taken off—for that reason this witness, Mr. Irwin, his superintendent, was called, whose duty it was to put on and take off all of the rubber tires.

Mr. Irwin testified, from his practical knowledge, as to the destruction of complainant's solid rubber tires before injured by use, as follows (Rec., 563):

"Q. 18. For what reason or reasons do you remove, or have you removed, the rubber tires of the complainant's and put on new tires

therefor? What happens to the tire that necessitates its removal?

"A. In most cases the tire is not worn to outside appearances. But is torn away inside of the channel.

"Q. 19. At what point or points is it torn away?

"A. I have seen it both torn at the sides and also the wire pulled through on the bottom."

Certified copies of all of these depositions appear in this case, as above indicated, the principal complaint being the same as in the case ten years ago, when these depositions were taken—the Grant patent being the same patent, and the tire being the same.

It is therefore uncontradicted in this record, and will be substantiated hereafter by the testimony taken in this case, that in the years 1897 and 1898, when this patent was little more than a year old, the tire, as constructed under and in accordance with such patent, in actual use, by the great carriage and livery houses of the two principal cities of the country, tore under lateral strain, the rubber was abraded and the tire was so injured by such strain that it was torn loose from its seat in the channel over the wire, both on the sides and on the bottom, and was so cut to pieces that the tire itself was ruined and worthless before the operating or wearing surface, or tread, of the tire was worn or injured in any detrimental manner by use.

Under the facts, then, as appeared in the record of such case ten years ago, and uncontradicted in this record, it is absolutely certain that the Grant

tire at that date had no capacity whatever, and did not in any way readjust itself and yield to severe lateral strain without tearing or abrading of the rubber or injury to any of the parts, but, upon the contrary, the tire of the Grant patent at that date, as a matter of fact, was destroyed as a tire, by the tearing and the abrading of the rubber, and the injury of its parts lying below the periphery of the flange in which it was seated, and had no capacity for readjusting itself to save itself from the fatality of tearing, abrading and injury of the parts.

The statement of the learned jurist, then, in the Firestone case and adopted as the opinion in this case, that "the Grant tire has capacity which no other possesses of readjusting itself and yielding to severe lateral strain without tearing or abrasion of the rubber, or injury to any of its parts," if any reliance can be placed upon human testimony and experience, as present in this record, simply cannot be correct.

The undisputed testimony in this record as to the yielding capacity of the Grant tire and its capacity to yield and relieve itself from lateral strain by the rising and falling of the wires without tear or abrasion of the rubber, or injury to any of the parts;—proves such asserted movement a myth and a fallacy.

The testimony in this case is clear and undisputed, and none otherwise, that the tire of the Grant patent today is destroyed by the tearing and abrasion of the rubber and the destruction of its parts,

brought about by severe lateral strain, and that the Grant tire is so destroyed, with few exceptions, before the tread or exposed portion or wearing surface of the tire is affected, or materially injured in any manner by actual use.

The testimony in this case, even at this date, ten years later, shows that a very substantial portion of the tires of the Grant patent in actual use, under severe lateral strain, tear out, and the rubber is abraded, and the tire injured, as to material parts below the rim or flange, before the wearing surface of the tire or tread is injured in any material degree.

Mr. Louis Keuhne, Chicago, a builder of carriages in Chicago for nineteen years (Rec., 273-4; Qs. 1-2), was called by defendant-appellant as a witness in this case, in January, this year, 1908, and testified that he employed on an average of fifteen or twenty men continuously, and had used the complainant's tire, the Rubber Tire Wheel Company, since 1894 or 1895. (Rec., 275; Qs. 6, 7, 8.) Mr. Keuhne, when interrogated as to the wearing of the Grant tire for the last ten years, said (Rec., 279; Q. 27):

> "A. In most cases the rubber was worn down to some extent, but in nearly every case they were cut through on the sides. That was the cause of our replacing them, because they were worn out and cut through on the sides.

Mr. Charles F. Hudson, a salesman, Chicago, and familiar with the solid rubber tire business, and these Grant tires since 1896 (Rec., 282-3; Qs. 2-3), and who had applied, and seen applied, thousands

of such tires (Q. 8), testified as follows as to this point (Rec., 284):

> "Q. 11. Have you ever seen or known of these solid rubber tires remaining in the channel without the rubber being cut out until the tire is worn practically down to the rim?
> "A. No, I never have."

Mr. Hudson testified that he had personally sold, in the United States, during the last ten years, hundreds of thousands of such tires. (Rec., 285; Q. 17.)

Mr. Fred C. Koenig, Wabash avenue, Chicago, salesman for a rubber tire company, and familiar with the Grant tire for several years (Rec., 291; Qs. 1, 2, 3), and who did nothing but apply these tires for two years (Rec., 293; Q. 5), when interrogated upon this point of the destruction of the tires by cutting and abrasion and destruction of the parts before the tread had been injured by wear, testified as follows (Rec., 293):

> "Q. 12. What proportion of these tires that you have put on and taken off as you have described, were worn out by the rubber being worn down to the channel and the tire base still in position without cutting out the bottom of the tire?
> "A. Very few, if any."

Mr. Charles H. Smith, Chicago, and the general manager of the Diamond Rubber Company of Akron, Ohio, for seven years at that place. (Rec., 305-6; Qs. 1-5.)

Mr. Smith was qualified to speak with great accuracy and authority upon this point, as to the de-

struction of the tires by cutting and abrading the rubber and destroying their parts before the usefulness of the tire had been seriously impaired upon its tread, by wear, and testified as follows (Rec., 315-6):

"Q. 27. In your experience and with your knowledge of these internal wire tires, state how and in what manner these tires are destroyed and rendered useless otherwise than by wear by use on the tread of the tire?

"A. By the action of the rubber on the stationary wires working from the inside towards the outside. That is to say, the constant straining and flowing of the rubber in actual use on the wheel of the vehicle pulling away from the wires and eventually enlarging and cutting and tearing out the rubber at the sides or bottom of the holes through which the wire is inserted, until it breaks through to the outside or base of the tire, as the case may be.

"Q. 28. What proportion, approximately, of these Grant tires, to your knowledge, wear out in actual use, by the rubber being worn down to the channel iron in distinction from being destroyed by the cutting out of the rubber on the sides or bottom of the contacting base?

"A. My personal observation has shown me that the percentage is very small. Would say somewhere between 5 and 10 per cent. Much depends as to the use to which the vehicle is put, and the conditions under which it is run or operated and used."

Mr. Leroy Eighme, one of the largest liverymen in Chicago, and an extensive user of the Grant tire, from the beginning (Rec., 345; Qs. 1-7), when interrogated as to the point of the destruction of the tires, by cutting of the rubber and abrasion and destruction of the parts before the tire had been se-

riously impaired on its tread or working surface by actual use, said (Rec., 346):

"Q. 15. But what is the matter with the tires that you take them off of your wheels?

"A. They are worn, the wires have cut through the rubber.

"Q. 16. Does the cutting of the wires through the rubber destroy the tires before they are worn out?

"A. Yes, sir.

"Q. 17. How many, or about how many, as to percentage of tires that you have taken off of your wheels are worn out down to the flange before they cut out?

"A. About one-third of them.

"Q. 18. Whereabouts on these tires does the wires cut out, on the side or on the bottom of the tires?

"A. On the bottom."

Mr. Harvey Edgerton, a prominent liveryman of Chicago, Illinois, for thirty-five years, and a user of the Rubber Tire Wheel Company's—the complainant—tire since the beginning of their sale (Rec., 351; Qs. 1-3), testified that in his experience about one-half of his tires were destroyed by ripping off from the wires, on the sides or the bottom. (Rec., 353; Qs. 17 and 18.)

Mr. Fred M. Meckel of Chicago, a wagon manufacturer for twenty-five years, employing some seventy-five men, and the user of solid rubber tires of the Grant patent for some ten years (Rec., 359; Qs. 1-6), when interrogated upon this precise point, said (Rec., 361):

"Q. 16. From your experience please state about what proportion of the tires that have been used by you during the last ten years have

worn down to the channel by use, and what proportion has cut through the wires and been destroyed before being worn out upon their tread or contact surface?

"A. Well, there are a few that have worn to the channel. The majority are worn, and as the rubber becomes lifeless they tear at the wires."

Mr. ALBERT BUBSER, foreman of the Owen H. Fay Livery Company in Chicago (Rec., 367-8; Qs. 1-3), testified as follows upon this point (Rec., 370; Qs. 11-12):

"A. Very seldom they are worn completely out. They are generally destroyed by the wires cutting through the rubber and allowing the tire to come off and leave the wires on the channel.

"Q. 12. Where do the tires cut through from the wires, either on the bottom or the sides of the tires?

"A. Right directly underneath the wires."

Mr. ROBERT H. WENZ, carriage manufacturer and in the rubber tire business for liverymen (Rec., 377; Qs. 1-3), testified that he had been familiar with the putting on and taking off of Grant tires for several years (Rec., 378; Qs. 6-7), and when interrogated upon this point, testified as follows:

"Q. 13. How are these tires broken?

"A. Some are channel cut, some are wire cut, some the rubber is broken, and some completely worn down.

"Q. 14. What part of these tires or portions of them is channel cut and wire cut?

"A. About three-quarters.

"Q. 15. What part of each tire is so cut; I mean top, bottom or side, of the tire?

"A. Sometimes on the bottom and sometimes on the side."

Mr. Frank C. Gorman, manager of one of the largest livery companies in Chicago for six years (Rec., 385; Qs. 1-3), and familiar with the Grant tires for some ten or twelve years (Q. 5), and who had put on and taken off thousands of them (Q. 8), testified that about one-half of these tires, so taken off by him, were destroyed by *cutting out at the bottom, before being worn out upon the tread.* (Rec., 387; Q. 12.)

Mr. Homer C. Knight, an extensive carriage repairer and dealer in rubber tires like the Grant tire for ten years past. (Rec., 398-9; Qs. 1-8.) Mr. Knight when interrogated in behalf of the defendant-appellant as to this precise point, said as follows (Rec., 401):

> "Q. 13. In what manner are these tires destroyed. I mean as to what happens to the tire to destroy it in the actual use of the wheel without wearing out?
>
> "A. It breaks out from where the wires are on each side."

Mr. Fred Krumbick, carriage painter and rubber tire setter, Chicago, and doing the work of some of the leading livery stables in equipping their vehicles with rubber tires, in that city. (Rec., 403; Qs. 1-2.) Had put on and taken off in the last six years a thousand solid rubber tires like the Grant patent. (Rec., 404; Qs. 8-9). Mr. Krumbick testified as to the point in question as follows (Rec., 405-6):

> "Q. 14. How many of these thousand tires, approximately, were worn out by the rubber being worn down to the channel before the tire was taken off?
>
> "A. None.

"Q. 15. What happened to the tire that it had to be taken off before its tread or bearing surface was worn out?

"A. They were either cut by the channel or the joints would work loose where they were connected together and in that way they would tear and we would have to take them off."

Mr. FRANK GLEMBLOW, one of the largest liverymen in Chicago, for some ten years. (Rec., 411; Qs. 1-3.) Mr. Glemblow testified as follows as to the destruction of the Grant tire, without wear (Rec., 412):

"Q. 11. How were the tires on your rigs destroyed before they were worn out on their tread or bearing surface?

"A. They were generally pieces cut out or busted in some place, fringed out."

Mr. JACOB E. HANSON, in the livery business twenty years in Chicago (Rec., 416), began using the Grant tires about the year 1895 (Q. 6); had used about 300 tires during that time, since the year 1895 (Q. 7). This witness testified as follows in answer to Q. 20; Rec., 419:

"A. If the tire is firm in the channel and remains so it will wear down to the channel.

"Q. 21. Well, out of every ten tires that were put on for you, how many of them wore down to the channel before cutting out at the sides or bottom?

"A. Well, the percentage is not very great."

Mr. EDGAR W. SAMUELS.—Mr. Samuels follows the business, and is the proprietor of the business, exclusively of setting tires for vehicles (Rec., 427; Qs. 1-2); in business for the last four years (Q. 6); has put on and taken off about 10,000 tires of the

Grant patent. (Rec., 428; Qs. 5, 6, 7.) Mr. Samuels testified that the tires were destroyed before wearing out by cutting through and chipping off. (Rec., 429; Q. 14.)

Mr. Ernest R. Wickstrom, a carriage maker and manufacturer of Chicago (Rec., 438; Qs. 1-2); had been putting on and taking off Grant tires for some three years, in that city. Testified that the tires taken off by him were mostly cut and torn and damaged, "more damaged than they are worn out." (Rec., 440; Q. 12.)

Mr. Charels H. Knight, president and general manager of the Chicago Rubber Tire Company, doing business on Wabash avenue (Rec., 445; Qs. 1-3); familiar with the Grant tires for over ten years. (Rec., 446; Q. 6.) This witness testified that his company during the last three or four years had put on or taken off some two or three thousand tires. (Q. 11.) He also testified that if the first grade of rubber was used, approximately 90 per cent. of the tires would wear down to the channel, but on cheaper grades of rubber the larger percentage of the tires would cut out at the side, or through the bottom, instead of wearing down to the channel, as in the case of the first grade of rubber. (Rec., 454; Q. 43.)

Mr. Albert Nolting, for many years the blacksmith for Frank Parmelee & Company, largest transportation company in the United States. (Rec., 462; Qs. 1, 2, 3, and Rec., 467; Q. 37.) Mr. Nolting personally had charge and conducted the taking off and putting on of the rubber tires of that company.

(Rec., 463; Q. 7.) Had taken off and put on such tires about four years (Q. 16); about three or four thousand tires. (Rec., 464; Q. 21.) Testifying as to this precise point, this witness said (Rec., 466):

"Q. 30. How were those tires that you have put on or that you have ever taken off, worn or destroyed; what was their condition when taken off?

"A. The wire was pulled through the bottom. Cut through the bottom of the tire.

"Q. 31. How many of the tires, as to proportion, that you have taken off these wheels, were completely worn out as to their tread or wearing surface without cutting through the wires? Give about the proportion?

"A. About seventy-five out of a hundred.

"Q. 32. Were cut out or were worn out, do you mean?

A. Worn out."

These witnesses comprise the largest, leading and most intelligent liverymen and carriage builders of the west, and their testimony upon this point is uncontradicted in this record, and, we respectfully submit, are a complete refutation of the statement or suggestion that the Grant tire has the capacity to "readjust itself and yield to severe lateral strain without tearing or abrasion of the rubber, or injury to any of the parts."

The whole body of the testimony of this case is uncontradicted and, except by the calling of one witness by complainant, not attempted to be contradicted as to the actual fact, viz., that the Grant tire, when wired on to the full tensile strength of the high carbon wire, by a machine, does not, and cannot, move from its contacting base, as clamped to the bottom

of the channel by these retaining wires—but is permanently clamped and affixed to said base in so doing.

In the opinion of the Court of Appeals of the Sixth Circuit, the court said, in speaking of the alleged tipping capacity of the Grant tire, and as to the presence of this capacity under violent lateral strain, as follows:

> "Its actual presence, from practical experience or observation is not shown."

This was said in the "Goodyear case". In this case a long line of witnesses have been examined, whose entire experience with this Grant tire has been practical, and whose observations of the workings and conditions of the tire have been constant, and each and every one of these witnesses have testified positively and unequivocally that when the Grant tire is wired and clamped in position by these two retaining wires, by the powerful machine so used in so doing, that the tire as to its base, and that portion of the tire forced into the channel and held upon the bottom of the channel by the clamping wires, never moves or is displaced from contact condition with the bottom of the channel by any lateral movement under any violent lateral strain met in any condition of travel.

I beg leave to call the attention of your Honors, antecedent to a detailed presentation of the evidence to establish this fact,—to certain conditions that make the testimony of the witnesses called, unusually persuasive and convincing, as to statements made.

These solid rubber tires are an expensive proposition, as to initial purchase and use. The manufac-

turers and dealers of these tires, like both parties litigant, have no interest in the prolongation of the life of the tire, except that their tire shall last as long, or a little longer, than their competitive manufacturer's tire, because the destruction of a solid rubber tire, before materially impaired by use as to its tread surface, is all in their favor, as it is manifest that a tire destroyed for any reason, means an additional tire sold to take its place, by a manufacturer. But the liverymen of the country, and the users of these solid rubber tires, who have to pay the large prices for these solid rubber tires, are intensely interested, and, in the case of some liverymen, vitally interested, in the lifetime of the tire. The public at this day and date demand that the liverymen equip their different vehicles with rubber tires, and the liverymen must meet this demand of their customers, or lose their customers, but the liveryman does not get a cent more fare from his customers by the use of the solid rubber tires. Therefore, as the price of these tires, and their use, may represent a substantial part of the earning capacity of his stable, each liveryman watches these tires and handles them with the utmost care and solicitude to assure the prolongation of the lifetime of the tires themselves, and, as appears by the testimony now following, all these liverymen in the larger cities in this day now apply, by mechanical devices, the solid rubber tires and remove them from their wheels when the necessity arises, and for this reason the testimony that now follows in this record was taken and secured from the leading liverymen, and carriage makers and users, in Chicago and New York, a class who constitute the principal market for rub-

ber tires in this country, and who know, from actual experience and observation, all about these Grant tires.

Mr. Thomas G. Broderick, an extensive carriage builder of Middletown, Connecticut, for about fifteen years (Rec., 231, Qs. 1-2-3); had applied the Grant tire for about ten years (Rec., 232, Q. 6); for eight years had applied his own tires (Q. 9). Mr. Broderick, when interrogated, specifically, as to whether or not the Grant tire, when fastened and locked upon the channel by the two retaining wires, stretched to their utmost tension, ever moved or lifted, from contact with the channel base by any kind of a strain that comes upon it in use, testified as follows (Rec., 234, Q. 18):

> "A. Not unless the wire breaks or something of that kind; never knew them to move unless the wire does break, provided both wires are drawn even; if they ain't drawn even it will draw the rubber to one side and allow it to roll out or break out."

Mr. Broderick further testified that he had never heard it stated, or claimed, that a Grant tire had the capacity of tipping or adjusting itself, or readjusting itself when such a tire was subjected to the severest lateral strain possible in use on the vehicle in travel. (Rec., 234, Q. 19.)

Mr. Francis A. Ludlam, carriage and wagon shop at Glen Cove, Long Island; had put on fifteen hundred sets of the Grant tires in about ten years (Rec., 248, Q. 9),—four tires to a set (Q. 10), this being six thousand tires. Drawing the wire just as tight as they could without breaking them (Q. 16); the same tension (Q. 18). Mr. Ludlam was then asked

the following question, and made the answer thereto, as follows (Rec., 249):

> "Q. 19. Mr. Ludlam, after these two wires have been tightened to their utmost tension and the rubber tire locked and fastened in the channel rim by this action, is it possible by any lateral side thrust of the vehicle upon which said tires are fastened and the wheels of such vehicle, or is it possible in any of the known movements to which a wheeled vehicle is subjected to in travel, no matter how severe, to raise or unseat this tire so fastened in the channel rim by lifting the wires in the slightest degree?
>
> "A. It can't be done, without the wire breaks."

Mr. OMAIRE J. DUHAMEL, carriage builder in Brooklyn for seventeen years, as large as any in Brooklyn. Equips his carriage with the Grant tires (Rec., 260), Qs. 1-4); been using Grant tires for ten years; puts on one hundred sets per year; four tires to set (Qs. 6-7), this would mean four thousand tires in the ten years.

Mr. Duhamel was then asked as follows (Rec., 262):

> "Q. 18. Mr. Duhamel, after these Grant solid rubber tires were fastened in position in the channel by stretching the two wires to their utmost tension by the machine and then brazing them, did those tires rise or fall in any way or to any extent, or could they rise and fall in the channel by any travel to which the vehicle was subjected, lateral thrust of the wheels or any of the severe movements to which the vehicle would be subjected in travel?
>
> "A. No, sir."

Mr. Duhamel testified that about three years ago he abandoned the Grant tires and used the two ex-

posed side wire tires in the channel, like one of the exhibits before the court. These wires are on the outside and can be easily seen, and their relation to the tire; the witness testifying that he had never seen these outside wires rise or fall, or move, up or down, or in any way, when the wheel was subjected to severe side strain, or the tires giving lateral movement in travel. (Rec., 263, Q. 25.)

Mr. Louis Keuhne, carriage builder of Chicago, nineteen years. (Rec., 273-4, Qs. 1-2-3.) Familiar with the Grant tire since 1895 (Rec., 274, Q. 5); had put on and taken off one thousand of these tires a year. (Rec., 278, Q. 22.) The witness was then asked to state the fact as to his knowledge, founded upon his ten years' use in the taking off and putting on of these Grant tires,—as to their being any tipping capacity in the tire to rise or fall under any condition of travel when the strain comes upon the tire, and the witness answered (Rec., 278, Q. 25) as follows:

> "A. It is my opinion that if the tire is applied properly and the wires have the proper tension there is no chance for the rubber to rise from the channel, the strain would be all above the wires,—or rather the give to the rubber would be all above the wires."

This witness had himself put on and taken off many of these tires, and had given his personal attention to the applying of them for ten years. (Rec., 280, Qs. 32-33.)

Mr. Charles F. Hudson, Chicago, familiar with the Grant tires by handling and selling them since 1896 (Rec., 282, Qs. 1-2-3); had seen thousands of them applied to various vehicles (Q. 8). The wit-

ness, when further interrogated as to whether he had ever known, or heard it claimed, that the Grant tire, when clamped in position on the rim by these two retaining wires, drawn to their utmost capacity, without breaking,—that such a tire so wired on could rise or fall in the channel when subjected to the most severe usage, replied (Rec., 285, Q. 16) as follows:

"A. I have never heard and I don't believe they can, when properly applied."

Mr. Fred C. Koenig, salesman for a rubber tire company in Chicago (Rec., 291, Qs. 1-2-3); familiar for several years with the Grant tire (Q. 4), and doing nothing but apply these tires to vehicles for two years (Q. 5); had put on and taken tires off of different kinds of wheels, as high as thirty tires per day. Mr. Koenig was then asked and answered as follows (Rec., 293):

"Q. 13. Among these hundreds and thousands of tires that you have put in position by using this machine which you have described and which you have taken off from wheels to be replaced, as to any one of these tires, have you ever heard or known of an instance where the two wires of the tire or either of them permitted the tire to tip up or the wires themselves tipped up to adjust themselves or to meet the side thrusts or strains that were put upon the tire in actual use in service, even of the severe style?

"A. Never, only in case of broken wires."

Mr. Koenig then testified that from his knowledge of these tires, and when they were wired on to the capacity of the wires, as follows, in answer to Q. 14, Rec., 294:

"A. No, sir. It is not possible for them to rise from their position after they have once been properly applied."

Mr. CHARLES H. SMITH, the manager of the Diamond Rubber Company, an Ohio corporation, at Chicago, Illinois (Rec., 305), and familiar with the Grant tires since the year 1901 (Q. 5); and directed and assisted in the work of putting on and taking off of tires (Q. 6), and has immediate knowledge of some twenty-five or thirty thousand sets put on by various manufacturers during that time. (Rec., 311, Q. 13.)

Mr. Smith testified that it was impossible for the tires, when wired to the channel as they should be, —to tip or rise or fall from their contact base in the channel by any lateral thrust movement put upon them on the exposed body of the rubber,—his exact answer being found on Rec. 312, as follows:

> "A. No, not if the tire is properly applied and the wires are tight enough. To overcome a possibility of this kind and to be sure that the wires remain tight and firm I always recommend the use of a high carbon wire, a wire that would not stretch."
>
> * * * * *
>
> "Q. 16. What is the object then of locking and clamping these internal wires and the tires so tight in the channel by straining the wires to the extent you have described?
>
> "A. To prevent the tires from slipping in the channel. The tire I always recommend must be applied so tight that it must be a part of the wheel itself.
>
> "Q. 17. Do you mean by that that the wires clamp the base of the tire so tightly to the rim that the wires and the base of the tire cannot move any more than the rim?
>
> "A. I do."

Mr. Smith then offered in evidence a wheel representing the ordinary manner of fastening and clamp-

ing the tire to the channel base, and it is here present and marked "Defendant's Exhibit Standard Rubber Tired Wheel." Mr. Smith then cut away two portions of this tire, and a portion of the rim in this exhibit,—the portion of the rim to illustrate how the wires could be slightly moved by a screw-driver or cold-chisel, and the leverage thereon, applied directly under the wires,—a leverage never possible in actual use,—and the cut away portion of the tire flush with the rim, exposing the two retaining wires, to show that no lateral thrust movement of the rubber, such as met in actual travel, could rise or lift or tilt the wires.

Mr. LEROY EIGHME, one of the leading liverymen in Chicago, conducting a large business for seventeen years (Rec., 345, Qs. 1-5), used the Grant tires since they came out (Qs. 6-7). As to the capacity of these tires to rise and fall in any strain of travel Mr. Eighme said (Rec., 348):

> "Q. 26. Mr. Eighme, upon those tires that were locked in position by the two wires on your various vehicles so that they couldn't creep, did you ever know or hear of those tires rising or falling by any strain that was put on the wheel and by the wires rising and falling in any kind of hard usage of your vehicles?
>
> "A. No, sir."

Mr. HARVEY EDGERTON, Chicago, liveryman for thirty-five years. (Rec., 351, Qs. 1-2-3.) Mr. Edgerton was then asked as to whether or not he had himself known, or had ever heard, that these Grant rubber tires had any capacity for rising and falling or tilting up and down in the channel by any strain of travel or use in Chicago, and he replied (Rec., 354, Q. 24):

"A. I never heard of it."

Mr. Edgerton abandoned the two internal side wire tires of the Grant patent some five or six years ago, and now uses the side wire tire like the "Defendant's Exhibit Firestone External Side Wire Tire." (Rec., 354, Qs. 26-7-8.)

Mr. FRED M. MECKEL, Chicago, extensive wagon manufacturer; used the tires of the Grant patent for the last ten years. (Rec., 359, Qs. 1-5.) Mr. Meckel also testified that when these Grant tires are properly wired to the channel he never himself knew, nor had ever heard it claimed that they moved or had any capacity of movement, as to rising or falling, or reseating themselves in the severe lateral strain or lift put upon them among the street car tracks of the City of Chicago. (Rec., 361-2, Q. 17.) Seventy-five per cent. of the solid rubber tires used by this witness were the side wire tires, instead of the two internal wire tires. (Qs. 19-20, and X-Q. 26.) Upon cross-examination Mr. Meckel said that they turned out about five hundred vehicles, of all kinds, a year. (Rec., 362, X-Q. 21.)

Mr. ALBERT BUBSER, foreman of one of the largest livery companies in Chicago, Owen H. Fay Livery Company, repair shop. (Rec., 367, Qs. 1-2.) As to any capacity of the Grant tire to rise and fall and tilt by said strain in travel, the witness testified as follows (Rec., 370):

> "Q. 14. Mr. Bubser, after you have placed these tires in the rim, and fastened them by stretching the two internal wires as tightly as you can without breaking them, do you yourself know, or have you ever heard of such tires and the two internal wires tilting or lifting in

any way from the channel bed in the travel and strain of the tire, no matter how great to which it is subjected, upon the wheels, on the car tracks in the streets of this city?

"A. Well, I will answer that, no."

Mr. Robert H. Wenz, business, carriage painter and the application and removal of rubber tires for the leading liverymen of Chicago. (Rec., 377.) Mr. Wenz testified as to the tires that had been clamped into position by the retaining wires stretched to their utmost tension without breaking, that he had put on various vehicles,—that such tires did not rise or fall from their base, or tilt on the worst conditions of travel over street car tracks, etc., without the wires broke. (Rec., 379, Q. 17.)

Mr. Frank C. Gorman, manager for Bane Brothers Livery Company, Chicago, one of the largest livery concerns in Chicago (Rec., 385, Qs. 1-2-3); familiar with the tire of the Grant patent for ten or twelve years (Rec., 386, Qs. 5-6); during the last eight or ten years he had personally attended to the removal from different wheels of thousands of these tires. (Rec., 388, Q. 18.) This witness testified that these tires, rightly wired and secured to the channel, it would be impossible for them to rise or fall or lift or reseat themselves by any strain that is put upon them, no matter how severe, in actual use and travel. (Rec., 388, Q. 18.)

Mr. Homer C. Knight, carriage painter, in Chicago, for nine years, who is familiar with the Grant tires, and had taken off and put on large numbers of them during that time, by machinery. (Rec., 398-9, Qs. 1-6.)

Mr. Knight testified that he never knew or heard of an instance where these rubber tires tilted or lifted or moved up and down, as to their channel base, unless one of the wires were broken. (Rec., 400, Q. 12.)

Mr. Fred Krumbick, a carriage painter and rubber tire setter, Chicago (Rec., 403, Qs. 1-2); with Moxley's livery stable about six years (Qs. 3-4); put the Grant tires on by machine for a number of years. (Qs. 8-9-10.)

Mr. Krumbick, when asked if, during the six years, he had ever known or heard of the solid rubber tires like the Grant patent, and that he had put on or taken off, after being wired on as tight as they could be without breaking the wires,—if he had ever heard or known that such tires had a capacity for rising and falling or tilting under any severe strain or travel on the car tracks of the city, replied (Rec., 405, Q. 13):

> "A. Well, I don't really know how to answer that. I would say no. I have had a few which came loose once in a while. That's about as near as I can answer it."

Mr. Frank Glemblow, an extensive liveryman in Chicago, familiar with the Grant tires since 1897. (Rec., 411, Qs. 1-5.)

Mr. Glemblow testified that on the rigs to which he had applied these tires, during the last ten years, he had never known or heard of the tires, when properly wired, rising or falling or tipping in any way, even under the most severe strains of travel among the car tracks, and did not think they could. (Rec., 411-12, Q. 9.)

Mr. JACOB E. HANSON, livery business in Chicago for twenty years (Rec., 416, Qs. 1-3); familiar with the Grant tire in use since 1895 (Q. 6); personally took off these Grant tires (Q. 10).

As to the alleged tipping capacity of the tires this witness said (Rec., 418):

> "Q. 17. Did you ever yourself know, or did you ever hear that the base of these solid rubber tires would lift from the channel, or the wires themselves would lift or tilt with any strain that was put upon the wheels of your rigs in the most severe and racking conditions of travel on the streets or car tracks of this city, to which they were subjected?
>
> "A. No. If they were properly applied they should not do that."

Mr. EDGAR W. SAMUELS, exclusive business, the setting of vehicle rubber tires, and proprietor of said business. (Rec., 427, Qs. 1-3.) Had taken off and put on, during the last four years ten thousand of such tires like the Grant tire in suit. (Rec., 428, Qs. 5-6-7.)

As to any tipping capacity of these tires when wired on by machine, as tightly as possible, without breaking, Mr. Samuels said (Rec., 428):

> "Q. 12. In putting on these 10,000 tires by these two internal wires by machine, as you have stated, to your knowledge, or have you ever heard of an instance, or have you ever heard anybody claim that the base of these tires below the two wires and contacting with the metallic channel or rim, or the two wires themselves, ever rose or fell, or the tire tilted in the channel, or the wires tilted or tipped under any strain or use that the wheel was put to, even of the severest character over and among the

street car tracks or on the worse streets in this city, in use?

"A. No."

Mr. Ernest R. Wickstrom, carriage maker and manufacturer, Chicago; had put on and taken off Grant tires for three years. (Rec., 438, Qs. 1-2-3.)

As to any tipping capacity of the Grant tire when clamped in position by the two retaining wires, the witness said (Rec., 439):

"Q. 10. Do you know whether or not you stretch the wires so tightly that they hold the base of the tire down into the channel rim so that it cannot move or be made to rise or fall or tip or tilt, no matter what strain is put upon the wheel and tire in the most severe usage in travel that you can put the tire to in this city?

"A. If the wire is put in right the rubber in a severe test will tear before it will get out of the channel or tilt."

Mr. Charles H. Knight, president and general manager Chicago Rubber Tire Company (Rec., 445, Qs. 1-4); been familiar with the Grant tires about ten years (Rec., 446, Q. 6); his company has put on and taken off some two or three thousand of these tires. (Rec., 446, Q. 11.)

Mr. Knight testified that in the ten years' application of these Grant tires he had never known an instance where these tires tilted or had any capacity to rise or fall, or lift or tilt in the channel from the base contact by any strain which the wheel was subjected to, even amongst the car tracks of Chicago, in actual travel, and that they could not so tilt or rise or fall, his actual answer being (Rec., 450, Q. 24):

"A. Not when properly applied, and the right carbon wire used."

A practical test in practical use absolutely confirming the fact of the non-tipping capacity of the clamping wires.

We desire at this point to call the attention of your Honors to a proven fact in this case that wholly contradicts a statement appearing in the opinion of the Court of Appeals in this case. (Rec., 682.) The court there says as follows:

> "The impossibility of proving or disproving in any satisfactory manner the existence of this tipping tendency by the observation of the vehicle in actual use *or the examination of a worn-out tire will be admitted after a moment's reflection.*"

It does not seem that this "moment's reflection" could have been given to this testimony of Mr. Charles H. Knight, that is uncontradicted and cannot be contradicted, and the truth of which is apparent and carries conviction with it, simply upon the reading of the deposition itself, and we here bring this deposition into this prominence as a complete meeting and refutation of this quoted statement from the opinion.

Mr. Knight was so confident of his knowledge and experience as to this matter, that to demonstrate and make certain his knowledge as to use of tires so applied, and his belief as to all tires so applied, that he made an actual demonstration of the truth of his position as to this matter,—that is, he applied a coating of cement to the base of the channel of a wheel and marked the position of the tire when applying it, or wiring it upon the wheel—that is, he cemented the tire to the channel, before wiring, in

the usual way, to the extreme tensile strength of the wires. He then drove, and had driven the vehicle upon which this wheel was run, around the streets of Chicago, and subjected it to all of the usual and unusual conditions of travel in the city among the car tracks and otherwise, and he personally attended to the cutting of the wires and removing the tire, and found it cemented then as initially placed, which, of course, proves that this tire at least had not risen or fallen or tilted or rocked by any of the strains of travel of a week's duration.

The narrative, as to detail, of Mr. Knight's demonstration is described in Rec., 450-4, and the wheel is in evidence as "Defendant's Exhibit Certain Demonstrated Wheel."

Mr. ALBERT NOLTING, the master blacksmith for Frank Parmelee & Company, the largest transportation concern in the United States (Rec., 462, Qs. 1-3); during the last four years has put on and taken off about three or four thousand of these tires. (Rec., 464.)

This witness testified that the tires that he put on, by stretching the wires to their utmost tension, without breaking, never rose or fell or tilted or tipped, in any way, by any strain that was put upon the exposed portion of the tire in travel. (Rec., 465-6, Q. 29.)

We respectfully submit that the uncontradicted testimony of these witnesses that, as a matter of fact, these Grant tires, when wired on and clamped in position, by the powerful machine so employed for that purpose, not only have no capacity to rise or fall by any kind of strain present in travel upon the

exposed portion of the rubber, but that, as a matter of fact, these men, watching these tires for the last decade, their construction and operation, and vitally interested in the lifetime of the tire, know whether these tires rise or fall or tilt or rock, and, knowing this fact, having all of them testified positively and unequivocally, that there is no such capacity in the tire, that such capacity is necessarily destroyed by the locking and clamping of both wires of the tire, to the channel, and does not and cannot exist,—such testimony is conclusive.

A fact present and a condition present in this record that demonstrates and makes it absolutely certain that there is no capacity for tipping or tilting or rising or falling, and no such result can either be present or obtained in a Grant tire, wired and clamped at its base to its channel, by stretching to their utmost tension, without breaking, the two retaining wires used for that purpose.

A long line of testimony has been taken in this case that bears directly upon this point, and that makes it absolutely certain that no such capacity exists in the Grant tire, when rightly applied.

The absolute confirmation of this fact is found in the testimony of the witnesses above quoted upon this particular point. The facts and conditions here testified to by these numerous witnesses, and uncontradicted, that makes the non-tilting action of this Grant tire certain, is that upon a large majority of wheels to which this Grant tire is applied, the fabric at the base of the tire immediately becomes cemented or fastened to the base of the contact channel rim,

by rusting or corrosion or cementing of the fabric and rubber to the channel base. It is well known, of course, that these wheels are driven, of necessity, through mud and water, and used in constant conditions that tend to rust and corrosion. Now nothing can be more certain than the fact that if these tire bases under the wires, or the wires themselves, had the capacity, and did rise and fall, or tilt and rock, in actual travel, there would be no rusting of the base of the tire to the channel rim, and no cementing or corrosion between the two parts, for any such movement in the tire, of necessity, would prevent such cementing, or would tear any tire loose from its base, if it became rusted thereon. These facts seem too plain for contradiction.

Now, turning to the long line of testimony represented by the witnesses we have before quoted and presented as to two other different points, we find that the testimony is positive and certain, and uncontradicted, that a vast majority of these Grant rubber tires, when taken off of the rim or wheel are found to be cemented or rusted through their fabric base to the channel rim, so as to require a very considerable force to strip them from the rim or wheel. The City of Chicago is peculiarly adapted to demonstrate this fact as to the cementing of the tire base to the channel rim, by the fabric and rubber contact, as the streets of the city are level, and in times of rain or mud, the rubber tires are constantly subjected to immersion and contact with mud and water. Indeed, some of the earlier witnesses found some of these Grant tires, purchased by them, cemented to the channel rims, and we will afterwards show that this was done by Grant himself.

Take the witness, Francis A. Ludlam, of Long Island, carriage and wagon builder and applier of rubber tires, for ten years (Rec., 247),—this witness, upon this point, testifying as follows (Rec., 251):

> "Q. 32. To what extent have you found those two wire solid rubber tires like the Grant patent before you, cemented to the channel rim?
>
> "A. I have found a few that way.
>
> "Q. 33. Have you ever followed this practice of cementing the solid rubber tires to the rim in addition to the retaining wires?
>
> "A. I did in the early years.
>
> "Q. 34. Did you ever find that these solid rubber tires cemented to the channel rim as shown in this Grant patent and held in position by the retaining wires, as you have described, to be lifted or broken loose from their channel bed in travel?
>
> "A. No."

All of the remaining witnesses that I shall now refer to are the same Chicago witnesses whom I have heretofore presented, and I will simply refer now to that particular point in their testimony relating to the cementing of the Grant tires to the channel rims by rusting and corrosion, and the incapacity to move from the channel base by this reason alone, and the absolute demonstration of this fact of their incapacity so to move.

Mr. Louis Keuhne, Chicago, carriage builder and applier of rubber tires (Rec., 274), testified as follows as to the cementing of the Grant tire to the rim (Rec., 278):

> "Q. 23. Have you ever noticed in the wheels upon which you have taken off these solid rubber tires that have been clamped in position by the two wires as you have described,—have you ever noticed whether these tires or the bottoms

of them have become fastened to or rusted onto the channel or rim of the tire?

"A. I have seen many of them.

"Q. 24. How much force would you have to use to strip or tear the base of the tire from the channel that had become thus fastened by rust?

"A. Giving it a good pull with the hand it would come off."

Mr. FRED C. KOENIG, practical tire man, Chicago, for many years (Rec., 291-2), testified as follows as to this certain effect in use by rust and moisture (Rec., 294):

"Q. 15. In taking off or replacing these old tires have you ever noticed the fact of the tires being stuck or cemented to the rims by rusting and being kept in one position?

"A. Yes, sir.

"Q. 16. About how much strength would you have to use in tearing these rusted two wire tires loose from the bottom or bed of the channel?

"A. Sometimes it would take a good jerk with the hands."

Mr. CHARLES H. SMITH, Chicago manager Diamond Rubber Company of Ohio, having placed and removed thousands of these tires, testified as follows upon this point (Rec., 316):

"Q. 29. In your extensive knowledge of the application and use of these two internal wire Grant tires have you become familiar with the fact as to whether or not it is a fact that these solid rubber tires become fastened by rust or by a species of cementing of the bottom of the tire to the base or bottom of the channel rim?

"A. I have seen any number of instances where the base of the tire has rusted and stuck fast to the base of the channel and always where the tires have been properly applied and kept tight during the period of their service."

Mr. LEROY EIGHME, one of the largest liverymen of Chicago, seventeen years (Rec., 345), testified as follows as to this fact, and as to his knowledge (Rec., 347):

"Q. 22. Mr. Eighme, in taking off these thousands of tires that you have from your wheels during the last seven or eight years, have you found any considerable portion of them rusted or naturally cemented to the rims at their base, so that the base of the tire and the iron of the channel rim at the bottom was rusted or fastened together?

"A. Yes, sir, a great many of them are rusted or cemented to the channel of the rim.

"Q. 23. How much force does it require, and in what way do you tear or separate these rusted tires from the rim?

"A. Sometimes when we pull them off they stick so hard to the channel that you pull the canvas off from the bottom.

"Q. 24. Do you do that with your hand, or your both hands?

"A. One hand sometimes, and sometimes two, when they stick fast."

Mr. HARVEY EDGERTON, one of the oldest and largest liverymen in Chicago, on the South Side (Rec., 351), testified as follows as to this sticking and cementing condition of the fabric or base of the tire to the channel rim. (Rec., 353-4):

"Q. 21. State what has been your experience in taking these tires from the wheels, as to the condition of the tire in being rusted or naturally cemented to the rim by rust or corrosion.

"A. The canvas usually sticks to the rim of the vehicle, the iron, the channel.

"Q. 22. How much force ordinarily would you have to exert to separate the base of the tire or canvas from the channel as rusted in?

"A. Ordinary strength.

"Q. 23. With your hands?

"A. Yes."

Mr. Fred M. Meckel, extensive wagon manufacturer and rubber tire applier, Chicago (Rec., 359), testified to this cementing condition, substantially upon all Grant tires removed, as follows (Rec., 360-1).

"Q. 13. What proportion of the solid rubber tires that you have become familiar with in your business for ten years past become rusted and adhered to the channel?

"A. Well, I should say a large majority of them.

"Q. 14. When you take these tires from their channel rims, when they are either worn out or destroyed, how much force is necessary, or approximately, to separate or tear these adhering tires upon their contact portions from the channel bottom?

"A. I don't know exactly how much force it requires, but it very often leaves the canvas, sometimes the lower body of the tire adhering to the channel.

"Q. 15. What I desired to ask was, whether the tires were torn from the channel by a machine, or by simply a hand pull?

"A. Well, my experience has been by the hand pull."

Mr. Albert Bubser, foreman for one of the largest livery companies in Chicago (Rec., 367), testified to the usual cemented condition of the tires to the bases, when removed, but also to the fact that this condition usually existed where slippery paste had been used. (Rec., 372):

"Q. 26. What I desired more particularly to know, was whether or not the base or canvas portion of the tire was rusted or naturally cemented by moisture and corrosion to the bottom of the channel, so that it would require some force at least with the hands to separate the tire base from the bottom of the channel?

"A. That is frequently the case when we use slippery paste."

Mr. ROBERT H. WENZ, carriage repairer and applier of rubber tires, for liverymen (Rec., 377), having applied about four or five hundred tires, testified that he had found about 10 per cent. rusted to the channel, and occasionally had to use a chisel to remove the old rubber. (Rec., p. 380, Q. 19.)

Mr. FRANK C. GORMAN, manager of one of the leading livery companies in Chicago (Rec., 385), testified as follows as to his personal knowledge upon this point (Rec., 387):

"Q. 13. In taking off these hundreds or thousands of tires for the last nine or ten years, what has been the usual conditions that you found as to these tires as to the base of the tire or canvas portion being rusted to or naturally cemented to the bottom of the channel rim by corrosion or rust?

"A. Well, nearly all the tires that I have had taken off were rusted to the channel, and sometimes it was hard work to get them off; on account of the accumulation of rust they were cemented to the channel.

"Q. 14. Usually what force would you have to use on them to separate or tear the tire away from the channel?

"A. We would have to pull on them considerable."

This witness testified that he had found this cemented condition so complete and powerful, in several instances, that the rubber tire was held in the channel rim by the rust cement after the wires were cut. (Rec., 388, Q. 16.)

Mr. HOMER C. KNIGHT, carriage repairer and applier of rubber tires, Chicago (Rec., 398), testified as follows as to this cemented condition (Rec., 401):

"Q. 15. In these rubber tires that you have removed from wheels during the last eight or nine years, in what condition do you find the base of the tire and the fabric in relation to the channel rim?

"A. In the majority of cases I found the fabric rusted to the channel."

Mr. Fred Krumbick, rubber tire setter (Rec., 403) for the large livery companies in Chicago (Rec., 404, Qs. 7-8-9-10), had put on and taken off a thousand tires (Q. 8). This witness, when interrogated as to this cemented condition, stated as follows (Rec., 406):

"Q. 16. In these thousand tires, or as many of them as were taken off by you during the six years you were with Moxley, what was the condition of those tires as to the base or canvas portion of the rim being stuck to or cement rusted to the channel rim when you took them off?

"A. Well, I don't exactly understand your question. Do you mean the way they are stuck in the channel? We used to cut them and most of the time we had to pull them out of the channel.

"Q. 17. Do you mean that you cut the wire when you took the tire off?

"A. Most of the time we cut the wires unless they were tore off before they came into the factory.

"Q. 18. After you cut the wires how much force would you have to use to pull the bottom of the tire free from the channel? I mean did you use your hands in so doing, or a machine?

"A. Oh, we used our hands.

"Q. 19. State whether or not in tearing the base of these tires from the channel any of the canvas stuck to the bottom of the channel?

"A. No, sir."

Mr. Frank Glemblow, liveryman, Chicago, for many years, testified as follows as to the cementing of the tires to the rims (Rec., 412-3):

"Q. 12. Mr. Glemblow, when you come to cut the wires to take off these old solid tires, would the wires on tires spring away from the wheel or would you have to use some force with your hands to separate the base of the tire from the rim channel?

"A. It depends on it. Sometimes the tire is worked loose in the channel, then it would fall off, but whenever we had to cut the wires and the tires was tight enough then we had to pull them off or generally they were rusted together with the base of the channel."

Mr. Jacob E. Hanson, one of the largest liverymen upon the South Side, Chicago, testified as follows upon this question of the cementing of the tires to the rims by corrosion or rust (Rec., 420):

"Q. 24. How do you mean would hold on? What would it hold on when the wires, both wires, were cut?

"A. The corrosion from the water which had accumulated there.

"Q. 25. How much force would you have to use to pull these tires off after the wires were cut?

"A. Doesn't require great force to pull them out, but they would stay there, though.

"Q. 26. Could you pull them off or tear them off of the rims with one hand?

"A. Yes.

"Q. 27. About what proportion of the tires would come off or away from the wheel when the wires were cut, and what proportion of the tires would stick to the rim by corrosion and had to be pulled off by hand? I don't ask for the exact figures; give your best estimate?

"A. Well, the percentage is very small. I wouldn't attempt to give a correct answer to that because I don't know.

"Q. 28. The percentage is very small, do you mean, of tires that will fall off when the wires are cut and don't have to be pulled off by the hand?

"A. Yes."

Mr. Edgar W. Samuels, Chicago, whose sole business is the application and removal of solid rubber tires. (Rec., 427.) Mr. Samuels, during the last four years, has taken off and put on about 10,000 of such tires, by machine application, stretching the wires as tight as possible without breaking. (Rec., 428, Qs. 4-10.)

Mr. Samuels testified as to this cementing condition of the tires to the channel base, when removed, as follows (Rec., 429-30):

"Q. 15. How do you mean were these old tires stuck to the channel; what stuck the tires to the channel after the two wires had been cut and the tire itself separated?

"A. The rust.

"Q. 16. What force would be necessary to be used to separate or tear these rusted-in tires at their base from the channel; I mean, would you have to do it by a machine, or pull the tires apart from the channel by the hand?

"A. By hand.

"Q. 17. Have you ever noticed whether or not in tearing the base of these rusted-in tires from the channel that any portion of the canvas or the rubber base would stick to the channel in pulling them off; state the fact?

"A. Yes, sir, I would."

Mr. Ernest R. Wickstrom, carriage maker and applier of rubber tires, Chicago, testified that most of the time the tires were loose, and would fall off, but sometimes they stuck to the channels and had to be pulled off or apart, on account of rust accumulation. (Rec., 440-1, Qs. 15 and 16.)

Mr. CHARLES H. KNIGHT, whose only business is the application of rubber tires, Chicago, and this is the business of his company, the Chicago Rubber Tire Company. (Rec., 445.) He has applied some two or three thousand tires (Rec., 446, Q. 11); testified as follows as to this cementing condition, or process, of these three or four thousand tires removed and put on by his company (Rec., 454):

> "Q. 45. Do you mean that in 90% of these old tires so removed there is an adhesion more or less by rust or corrosion between the canvas and rubber base of the tire to the rim channel?
> "A. That is precisely what I mean."

Mr. ALBERT NOLTING, the master blacksmith of the largest transfer company in the United States, Frank Parmelee & Company (Rec., 462), testified as follows as to his actual knowledge as to the cementing condition between the base of the tires and the channel rims, at the time of the removal of the tires (Rec., 466):

> "Q. 33. Of these three or four thousand old tires that you have taken off of different wheels in the last four years what proportion of those tires, if any, were rusted or more or less corroded or stuck as to their canvas and rubber base to the wheel rim?
> "A. I would judge about seventy-five out of a hundred were stuck.
> "Q. 34. About what force would be required to tear these tires loose or separate them from the rim base?
> "A. Some of them I could pull out by hand; some of them I had to pound out with a hammer."

Defendant's (petitioner appellant) expert testified as to the alleged tipping capacity and tipping action of the Grant tire under severe lateral strain,—finding no such capacity.

Mr. Samuel N. Pond gave an extended deposition bearing directly upon this alleged tipping capacity, or action of the Grant tire, under severe lateral strain, in their use upon vehicles, and his testimony is, unequivocally and emphatically, that no such tipping capacity existed in the Grant tire when wired on properly by the straining tension of the two retaining wires, by any force that could be brought upon such tire in actual travel. Mr. Pond being asked this question, and his attention being called also to the diametrically opposing positions of the judges of the Court of Appeals and of the Sixth Circuit upon this point, he testified in full as to this matter, and gave his reasons, both from personal observation, tests and experiments, and fully in connection with his opinions expressed. It will be without profit to quote in this brief Mr. Pond's extended deposition and reasons as to this alleged capacity for tipping of the Grant tire, either in actual use, or any suggestion thereof in the patent. His opinions, arguments and conclusions as to this matter are found in this record on pages 135 to 149, inclusive, and Mr. Pond then introduced in evidence a drawing illustrative of the only action of the Grant tire in use under varying loads, and which clearly, and more than usual in such cases, speak for themselves, as to each drawing, or figure. These drawings repre-

sent Mr. Pond's entire deposition and statements as to the alleged tipping capacity of the Grant tire, illustrating in the first six figures the only action of the tire possible in practical use, by lateral force or lateral strain, and illustrating in Figure 7 the theory of complainant's expert, and the position of complainant as to the tipping action and position of the Grant tire from several tire tests. We request the careful study and inspection of these drawings by the court, in connection with a study of the statements of Mr. Pond in connection therewith. This drawing is marked "Pond's Drawing No. 2," and appears in the record upon page 144, but is here reproduced for more convenient reference of the court. Mr. Pond says as to this drawing in his deposition (Rec., 145).

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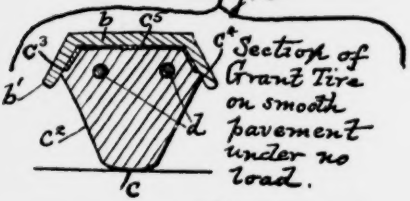
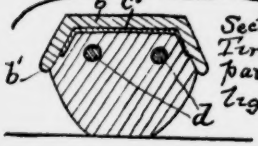
Defendant's Exhibit Pond Drawing No. 2.

Fig. 1



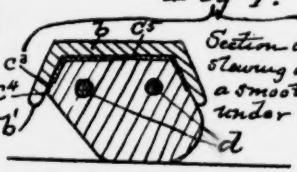
Section of Grant Tire on smooth pavement under no load.

Fig. 2.



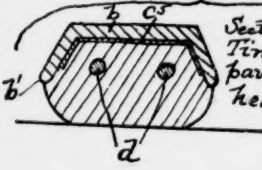
Section of Grant Tire on smooth pavement under light load

Fig. 4.



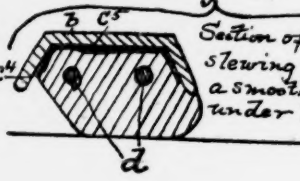
Section of Grant Tire slewing or skidding on a smooth pavement under light load.

Fig. 3.



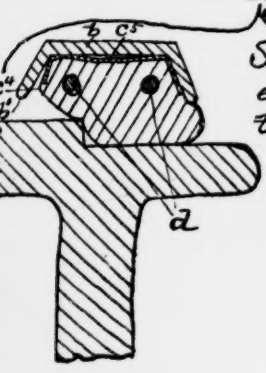
Section of Grant Tire on smooth pavement under heavy load.

Fig. 5.



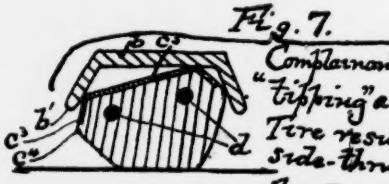
Section of Grant Tire slewing or skidding on a smooth pavement under heavy load.

Fig. 6



Section of Grant Tire encountering side-thrust of a rail of a street-car track under load.

Fig. 7.



Complainants' alleged "tipping" action of Grant Tire resulting from side-thrust under load.

> "These figures are free-hand sketches, and no claim of mathematical and geometrical exactness and precision is made for them; but they have been drawn in strict fidelity to all of the detail features of the Grant tire as disclosed in the patent in suit, and will serve to aid the eye of the court in following my description of the real action and behavior of the tire of the patent in suit under various conditions and circumstances."

This court says in its opinion, as above quoted, "that the Grant tire has the capacity which no other possesses of readjusting itself, and yielding to severe lateral strain, without tearing or abrasion of the rubber or injury of the parts," etc.

It would seem to be manifest that this statement is too broad as identifying the actual facts as a mechanical proposition. It is perfectly evident that if this Grant tire has the capacity to rise and fall and readjust itself in actual use, under force laterally applied, several of the other devices exhibited in the old tire art show tires that of necessity must have this capacity for tipping.

Mr. Pond discusses this question from a mechanical standpoint, and can see no reason from a mechanical standpoint why if this action is present or permissible in the Grant tire, it is not also of necessity present in several of the tires of the old art. Mr. Pond's discussion of this question, in detail, is found on Rec., pp. 157 to 162, giving the names and identifying several patents, United States and foreign, that have this rising and falling and tipping capacity of the tire in action—if the Grant tire has it. Mr. Pond has had nine years' experience in the United States Patent Office, and has additional rea-

son for knowing whether a patent, as to a disputed question of operation, possesses that mode of operation or whether that mode of operation so plainly inheres in the structure disclosed that there is no need to mention the operation or quality in the patent itself. Mr. Pond testified upon this point in question as follows (Rec., 162-3):

> "Q. 10. Do you find in this Grant patent any thought, idea or suggestion in any way, either in drawings, specifications or claims, that would lead you to suppose that following the Grant patent there resided in that patent any tipping capacity of the tire, or that said patent had in any way disclosed a capacity of the Grant tire to tip or readjust itself after yielding to severe lateral strain?
>
> "A. I do not find in this Grant patent any such thought, idea or suggestion, or anything that would lead me to suppose from a reading and study thereof that the construction disclosed and covered by the patent possessed any such capacity either as to the tipping or the subsequent reseating or readjustment. The court says, in the opinion from which I have just quoted, that:
>
> "'It now appears that the feature which secures patentability is inherent in the patent. * * * This feature was neither an accident nor an "obscure property"; it exists in every wheel on which is mounted a tire which follows the teachings of the patent.'
>
> "I know from my nine years' experience as a Patent Office Examiner that it is not the practice of the Patent Office to issue patents wherein 'the feature which secures patentability' is not clearly and distinctly set forth. In fact the feature or features which secure patentability are those which are required to be shown and described with the greatest clearness and fullness for the benefit of the public, that they may know

how to practice the invention when the patent shall have expired. No Examiner of the Patent Office, who is faithful to his sworn duty, allows a patent to issue under his favorable judgment thereon with the feature which secures patentability, whether it be a mechanical element or a novel quality or capacity flowing from a new arrangement or harnessing of old mechanical elements not fully described in plain terms in the specification of the patent. The feature which secures patentability in any properly issued patent is the feature of all features required to be made known with the greatest completeness and certainty. Hence I am confident that the Examiner who passed upon and allowed the application for the Grant patent in suit had no knowledge or even suspicion of the existence of this alleged quality or capacity of the Grant tire to tip and yield under side thrust in a manner to save the tire from injury and automatically readjust and reseat itself, or he would have required a full and clear description of this feature or capacity to have been inserted in the specification before the application would ever have been passed to issue by him. So far as the 'teachings of the patent' are concerned, they teach a lot of old things equally well taught in the art antedating the patent in suit, such as the shape of the channel rim, the cross-sectional contour of the tire, the retaining wires and their location in the tire and rim, and the canvas reinforcing strip—but not one word of teaching do I find in the patent in suit about this alleged novel quality or capacity of the Grant tire which is supposed to elevate it to the dignity of an invention."

The practical testimony as to this question of the alleged tipping of the Grant tire under severe lateral strain is as fully presented in this record as possible under the order of court limiting the time for taking of defendant's testimony. The court, under

specific order, limited the time of defendant to complete their testimony to forty days. Complainant's counsel refused to consent to the giving of defendant any further time for taking their testimony, although in the forty days given there came out of it the Sundays and various holidays, and the Christmas vacation,—and this further in face of the fact that the complainant in this case went on and took testimony in so-called rebuttal, and moved at the closing to set the case peremptorily upon the calendar, and this in face of the further fact that the case had been noticed by complainant to be set down for hearing immediately upon the closing of the testimony for the defendant, and the same had been so set down. We presume that this comment or complaint is surplusage, for the reason that the complainant did not take but one deposition to attempt to rebut it, hereafter discussed.

There is not a particle of doubt that all of the regular users of rubber tires in the United States would have given precisely the same testimony as here set forth, both as to the fact that there is no tipping capacity in the Grant tire, when wired and clamped in properly, by the utmost tension of the wires by a mechanical appliance capable of exerting this force, or the fact that with but few exceptions all of the solid rubber tires of the Grant patent in suit are cemented or glued as to their base of canvas portions which come in contact with the channel rim, to the channel or rim by corrosion and rust.

Mr. Charles H. Knight, a salesman familiar with the application of rubber tires in twenty-seven states, testified as follows as to this point (Rec., 459, R-D. Q. 79):

"R-D. Q. 79. With your familiarity of the putting on and taking off of these solid rubber internal two-wire tires, and with this trade in the twenty-seven states, as you have testified, have you any doubt, Mr. Knight, that every liveryman in every principal city of these twenty-seven states, and every party engaged to any extent in the putting on or taking off of tires in those states, would testify exactly as you have relating to the application and use and conditions of removal as to such tires?

"A. I don't know that the liverymen or the private users of solid rubber tires would be in a position to give an intelligent opinion regarding the *application* of solid rubber tires, but I do believe that the large users of rubber tires, meaning the carriage trade throughout the country, would substantiate and bear me out in my statements."

Complainants' counsel in the argument of the case below seemed to think that Mr. Knight had thrown discredit, not only upon his own deposition as to this matter, but as to the deposition of the liverymen or private users of solid rubber tires. It is entirely plain what Mr. Knight actually meant,—that is, that in the countless numbers of small towns in the United States where the liverymen or private users do not put on or take off their own tires, but send them to the blacksmith shop, that such liverymen and private users of the Grant rubber tires would not be in a position to give an intelligent opinion *regarding the application of solid rubber tires,* but an intelligent opinion could be given only by those liverymen and private users who actually themselves applied the tires and removed them.

We shall now assume, with great confidence, that this court will consider established as a fact by this

testimony that the Grant tire, when wired and clamped into position by straining the wires to their utmost capacity by the powerful machine employed in so doing,—fixes and clamps the base of the tire to the tire channel so that there is no possible capacity for the tire rising or falling or yielding or leaving its base, or tipping in any way in the channel, by any lateral thrust put upon the exposed portions of the tire in travel, no matter how severe.

The single, lone, solitary witness called by complainant to negate the facts as testified to by all of the witnesses above and foregoing, and who testified from his own knowledge and observation that the tires would tip sidewise, when wired to the full capacity of the retaining wires.

Phillip Erenwein, a witness called by the complainant, testified that he was a blacksmith in the employment of the complainant (Rec., 49), and had been engaged in applying rubber tires for the complainant five or six years (Rec., 49), Qs. 4, 5, 6 and 7); taken them off and put them on up into the thousands. This witness testified that he had seen these tires tip sidewise in the channel; had seen them do the same thing going around curves "so that you could see under the corner of the base of the tire above the flange of the channel," and that this tipping would raise the wires with the tire. (Rec., 50, Qs. 12-13.) This witness was ordered by the court to be produced for cross-examination. Upon cross-examination he said that he had only seen the tire tip sidewise in one instance (Rec., 72, X-Q. 81), but

he could have seen it under the same circumstances in a thousand instances (X-Q. 82); that the one instance where he saw it was upon the corner of Eighth avenue and 58th street, when the vehicle was going around the curve and the streets were wet, and the vehicle slewed, "which caused the tire to skid." (Rec., 72.) And he testified that this was a very common occurrence and happens millions of times in the city. (X-Qs. 83, 84, 85.) This witness also testified further as follows (Rec., 74):

> "X-Q. 111. And you never did see any rubber tire lift up and reseat itself in going out of a car track?
>
> "A. No, I did not."

This witness finally remembered another instance where he had seen the tire lift up from its base with the wires. That was at 47th street in front of Brewster's carriage factory (Rec., 74, X-Qs. 115, 116); the wheel ran up against the curb. (X-Q. 118.) In this instance he saw the rubber tire move up from the base—standing right in front of it. (Rec., 74, X-Qs. 123-4.) The witness then testified that he saw this tire move from the base in front of Brewster's this year, 1908; that in the other instance, on 58th street, it was about seven years ago. (Rec., 75, X-Q. 127.) The witness was also asked the following cross-question and gave the following answer as to the early practice of completing the tire before jumping it into the rim. (Rec., 75):

> "X-Q. 131. But in the early beginning of putting tires on these Grant tires it was the universal custom to fasten the ends of the wires and complete the tire before jumping them over the rim, was it not?
>
> "A. Yes, sir; to my knowledge that was the first way of applying them at the start."

The witness then said that he did not know but that in these two instances when he saw the tire rise and fall that the wires might not have been drawn tightly as they did even when they first jumped them on. (X-Q. 132.)

We respectfully submit that the deposition of this witness simply proves two things: First, that if the Grant tires have the capacity of lifting and tilting and rising and falling under lateral strain, this capacity and operation can be observed by anybody in the actual travel of the tire under these conditions; and, second, that as to the two instances that he did see this rising and falling action in solid rubber tires on vehicles in New York he does not know but that the tires were wired on loosely and not so tightly as to prevent this action.

Incidentally, the uncontradicted testimony of this witness also negates the statement in the opinion of the learned jurist who wrote the opinion of the Court of Appeals in this case, to the effect, namely:

> "That the human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction, at an angle of 45 degrees."

Whatever way his deposition may be read it can in no way militate against the depositions and the reasons given as to the rigidity and immovability of the tires of the Grant patent when clamped into position by the two retaining wires drawn to the extent of their straining and clamping capacity.

Antecedent facts and conditions appearing in this Record that prove conclusively—that this discovery that the Grant tire of the Grant patent has the capacity of yielding under severe lateral strain and does tip thereby and reseat itself; is a discovery not only not anywhere found in the Grant patent, but not known or suspicioned by Grant until several years after the date of his patent; and, that its discovery is due to the "keen optimism of professional experts."

First. There is in this record, and forming a part of this record, a number of depositions taken some ten years ago in the case of one of these complainants, *The Rubber Tire Wheel Company* v. *Firestone Victor Rubber Tire Company et al.,* in the United States Circuit Court for the Northern District of Illinois, and those depositions are marked "Defendant's Exhibit Original Testimony Illinois Case Nos. 1 and 2." The patent in that case and this case was issued in the year 1896 and the last above referred to suit was begun in the year 1897. The depositions of the various witnesses taken in that case, and now appearing under certified copies in this case, all relate to the Grant tire and the Grant patent, and, of necessity, if it had been known or considered at that time that this Grant patent and tire disclosed or made any reference to the function or operation which is now considered by this court to be the main object of the patent, namely, the capacity of rising and falling and lifting and tilting under lateral strain in travel, this fact would have been, somewhere or other along the line, disclosed or suggested

in the taking of testimony in that case. But your Honors can read these depositions from start to finish, and you will find nowhere in any of them any statement or suggestion even, that the Grant patent disclosed this capacity of tipping under lateral strain of the Grant tire, or any statement or suggestion that in actual use the tire had any such function, purpose or capacity. It does seem a little strange, then, that if this now asserted tipping capacity, and now affirmed by complainants to be the chief capacity of value of the tire, was supposed to exist at that time, some one of these numerous witnesses, or complainant's then counsel, did not say so. Lord Macauley, in one of his essays, in speaking of a noted character of his day, well known as a gifted liar and prevaricator, said that "the wonder was not that this celebrity through a long life was a notorious and persistent liar, but the wonder was that he never during that long life had ever been known to even accidentally speak the truth;" and the curiosity I think that will strike your Honors in reading these depositions in these old first cases is, not that nowhere in these depositions by any witness, or counsel, was it ever intimated or suggested that this tipping capacity was inherent in the Grant patent and always present and apparent in the Grant tire, but the wonder is that during the whole of that record no witness ever even accidentally referred to this supposed fact. We take it that the silence of the complainant and patentee in this case, at that time when they ought to have spoken as to this matter, is proof of the highest order that such silence was due to the fact that they had no conception, much less knowledge, of any advantageous tipping capacity in the Grant tire, or suggestion of same in the Grant patent.

SECOND. "Mine enemy hath written a book!" There appears in this record as a part thereof certified copies of two depositions given by the patentee Grant in the case of this complainant, *The Rubber Tire Wheel Company* v. *Columbia Pneumatic Wagon Wheel Co.*, pending in this circuit in the year 1897. Grant's first deposition was given in April, 1897, and is printed in full in this record on pages 577 to 617, inclusive. Also, a second deposition of the patentee Grant was taken in that case in August, 1898, printed in this record between pages 620 to 666, inclusive. Grant at that time evidently had no knowledge of any tipping capacity in the tire construction under his patent, or any suggestion of any such capacity that could be read into, or out of, his patent, and the patentee Grant evidently at that time thought and knew that where any such capacity could possibly be present by jumping the completed tire into the channel, and so loosely that it would tilt or lift, that any such capacity was a marked detriment to the tire itself. In this deposition Grant was given opportunity, over and over again, to state his knowledge or belief as to any such capacity in his tire or patent, but nowhere asserted any such capacity, as, for example, appearing in his deposition Rec., 578 to 583, and upon cross-examination between Rec., 598 and 603, inclusive. In this deposition Grant testified upon this point affirmatively as follows (Rec., 622; the italics following are ours):

> "The retaining wires in the tire, in my opinion, *stand still or continue to retain their original position with relation to the steel channel.*"

Of course if these retaining wires stand still they could not tip and rise and fall under the varying emergencies of travel, as now asserted.

Grant again says, in this old deposition (Rec., 625, Q. 5) as follows:

> *"I have observed that when the tires are put on sufficiently tight, that they will still be as tight when the tires are worn out; that is, the section of rubber still left in the steel channel will be as tight as when originally put on."*

Certainly this would be impossible if the contacting rubber under the wires tilted and lifted and rose and fell in travel. Again, the patentee Grant said in his deposition of ten years ago, speaking as to whether or not a large or small wire were better for use in the tire, as follows (Rec., 634, Q. 21):

> "The large wire was better as it was not so liable to tear through the bottom of the rubber tire in case of an exceedingly heavy strain or shock on the tire."

Of course Grant could not have then known himself that his tire possessed the capacity of "reseating itself and yielding to severe lateral strain without tearing and abrasion of the rubber or injury to any of the parts,"—or he never would have made this oath more than twelve years ago.

The patentee Grant in that deposition then made the following remarkable statement, which shows beyond any question of doubt, cavil or criticism, that the tipping and tilting capacity in the Grant tire, as originally constructed by him under his patent, and arising out of the fact that the tire was first made and jumped over into the channel rim, and as so loosely applied, would, to a certain extent, tip over in the channel, by reason of this fact,—that Grant considered this tipping over of a loose wire a defect and disadvantage to be overcome, by making the

tire fixed at its base in the channel. Grant in his 1897 case, last above identified (Rec., 651), testified as follows:

"X-Q. 59. You have mentioned two devices used by you in your efforts to prevent traveling of the rubber in the channel. Did you at one time resort to the plan of cementing or sticking the rubber to the channel for this purpose?

"A. *We used cement at one time, but not for the purpose of keeping them from traveling, but for the purpose of preserving the canvas on the lower side of the rubber and to assist in keeping the rubber tire from 'tipping over' in the channel. The witness at that time thought that it was a benefit to allow the tire to creep slightly and still thinks so, and, as stated before, this cement which was nothing more than common shellac, was put in there for the purpose stated.*

"X-Q. 60. When did you abandon the use of the shellac?

"A. *We discovered some three years ago probably that the shellac was of no particular benefit, but still we could not see that it done any harm and we instructed our branches that they could use it or not, just as they chose, and I could not state when they all abandoned using it.*"

Here we have this patentee Grant testifying solemnly, under oath, at a date prior to the discovery of the alleged tipping capacity, by his experts, to a fact, namely, the fact that in the tires, as first constructed and applied under his patent, he cemented them at their base to the channel to prevent the tire from "tipping over" in the channel, and that this was common practice, even to instructing their branch agencies so to do at that time. It is entirely evident also from these quotations from Grant's 1897 deposition that he thought that the wires, although

jumped over in the channel, would hold the tire tight enough and firm enough to its base to prevent tipping, but that the wires, although somewhat loosely applied, supplemented with cement, prevented this tipping.

This testimony of Grant, nearly fourteen years ago, is also complete confirmation of the testimony of certain witnesses in this record, above quoted, to the effect that the earlier Grant tires, put on under the patent in suit, were cemented to the rim, and no movement possible at the base. There can be no question that if the Grant tire is cemented to its seat or base this "distinguishing feature" of tilting of the Grant tire would be eliminated. Upon this point we have the high authority of the Court of Appeals in its opinion in the Firestone case, in speaking of the Latta patent of May 11, 1886, and stating among other reasons the impossibility of this patent anticipating the Grant patent, as follows:

> "The description says that 'it is obvious that the tire may be secured to its seat and cemented in the usual manner, if it is desired.' *If this were done the distinguishing feature of the Grant tire would in any view be eliminated.*"

It would really seem folly and foolishness to contend that Grant knew, or had the faintest conception, or suspicion, of the presence of this advantageous "distinguishing feature" of tipping in his patent when he cemented the base of his tire to its seat in the channel rim, as he says in his deposition, "to prevent tipping."

THIRD. The patentee Grant disclosed in his testimony given ten years ago, as shown by certified

copy of such deposition in this case, that about a year after the grant of the patent, Grant discovered that his tire when completed beforehand and jumped on the wheel into the channel, was practically a failure, and that this complainant, the Rubber Tire Wheel Company, and Grant, who was then vice-president of that complainant, changed their method of completing and jumping on the tire, to the new method of straining the wires to their utmost tension without breaking, in applying the tire, and thus clamping the tire, to its base, down upon the rim. This matter is made clear in the deposition given by Grant upon his patent ten years ago, and appears in this Record, 649. The condition of the tires of the Grant patent as made and used for some time after the grant of the patent is well set forth in a quotation from the deposition of one of the now active counsel for the patent in this case, Mr. Stapleton, who was the leading witness against the grant patent, and was an active factor in behalf of the defendant then sued. Stapleton then testified as follows (Rec., 648):

> "It is my judgment that the tires of both the complainant and the defendant *as they were applied at the time this suit was brought, and for a long time afterwards*, was an absolute failure and would not satisfy the public for any length of time."

Fourth: The prior Blosser & Kunkle patent, No. 529,474, November 20, 1894—File-Wrapper and Contents,—suggestion "tipping capacity" entirely absent.

Admittedly this patent antedates the Grant patent, and admittedly this patent shows the precise thing or device in one of the drawings, shown in the Grant patent, and if this patent stood as a prior patent in the record there could be no contention that everything shown by Grant and claimed by Grant was shown, at least, if not claimed, in the Blosser & Kunkle patent. It is contended, however, by complainants that the Blosser & Kunkle patent, although prior in date to the Grant patent, was subsequent in date of invention, for the reason that Blosser & Kunkle were connected with Grant at the time he professes to have made the alleged invention of the patent in suit—were personal and confidential friends of his, and that Grant confided in them everything relating to his invention, and that their patent is for an entirely different invention, as to subject-matter, being an invention upon wheels, and not upon tires.

An examination of the file-wrapper and contents of the Blosser & Kunkle patent shows, however, that there originally was a claim in the application as follows:

> "The combination with a wheel having a grooved felloe, as described, of a rubber tire secured in said felloe by retaining wires, and having a central groove or recess on the inside of said tire and without said felloe, substantially as described."

One thing is certain, therefore, that Blosser & Kunkle, neither in their application for their patent, nor in the patent, as granted, gave any hint or intimation that they supposed that the tire of their patent had any capacity for rising or falling or tilting under lateral strain, and it is very curious that if Grant had confided to them any such quality in his tire construction, or his knowledge of any such "tipping capacity" they would not have said something about it, either in their patent, or in the application therefor, as shown by the file-wrapper and contents. Their silence upon this point is a strong antecedent condition, cumulative in its effect to the end that the bosom friends of Grant, who took out a patent on a tire precisely of his construction, before Grant ever went into the Patent Office, did not disclose or suggest, in any manner, any "tipping capacity" in their tire. Defendant's expert, Mr. Samuel N. Pond, discusses this Blosser & Kunkle patent and these contentions (Rec., 119-20).

Fifth: The File-Wrapper and Contents of the Grant patent in suit—shows no suggested "tipping capacity."

It is a curious fact also that while, admittedly, Grant himself in his patent makes no suggestion of this alleged "tipping capacity" nowhere in the file-wrapper and contents, and his action in the Patent Office, and in none of the correspondence between Grant and his attorney and the Patent Office, as disclosed by this file-wrapper and contents, is there any suggestion or mention, in any

way, of this alleged "tipping capacity," although if such capacity had been thought to exist the fact would have been presented by Grant and his attorney and made prominent in their argument in the Patent Office to obtain the patent. Some of the claims of Grant, as originally filed, in the Patent Office and abandoned, point affirmatively to an entire ignorance of Grant at that time upon this point. This matter is discussed analytically and entirely by defendant's expert Pond (Rec., 166-170), Mr. Pond closing his review of this Grant file-wrapper and contents by the following statements (Rec., 170):

> "In further answer to this question I might add that in none of the correspondence between the applicant and the Patent Office do I find any mention or suggestion of the alleged 'tipping capacity' of the tire, which, had it been known at that time, undoubtedly, I think, would have been strongly urged, and an argument for the allowance of the patent."

The above classified antecedent facts and conditions discussed under the above five clauses seem to make it certain that, so far as Grant himself is concerned, neither at the date of the application for his letters patent in suit, nor for several years after its grant did he, or any of his attorneys or experts, have any knowledge, belief or conception that there existed any desired "tipping capacity" in his tire, nor any possibility of any "tipping capacity," except that which resulted from looseness in applying the tire over the rim, with the resulting disadvantages for so doing, fully disclosed by this record.

The record is simply full of a vast number of old

patents relating to rubber tires of every conceivable form, both as to metal and rubber, and some of them so closely approximating the Grant patent as to parallelism of construction and operation that there would really seem to be no opportunity for substantial differences, either as to construction or result between Grant and the old art.

The wide success and wide use of tire of the Grant patent reulted from no disclosure in the patent itself, but from three subsequent discoveries and conditions since the grant of the patent.

This fact and condition is proven by three separate, undisputed classifications of testimony in this record:

(1) That the tire of the Grant patent could be clamped and fixed in position by the straining of the two retaining wires to their utmost tension and thus holding the tire base immovably in constant fixed position upon the channel rim;

(2) The production, by mechanical means, cheaply and expeditiously as a commercial product, of the channel rim in straight lengths to be applied to the wheel; and

(3) The improvement of the rubber itself; the demand of the public for a solid rubber tire, and the wealth of the complainant, advertising in the market, and pushing and exploiting the tire.

There is no doubt that the complainant, the Rubber Tire Wheel Company, and Grant, in the first place, completed and jumped the tire into place over

into the rim; this is now admitted by complainant and it follows, as a matter of course, that the same force which jumped the completed tire into the rim would jump it out again in actual use. The records disclose the fact that the act or thing which made, more largely than any other condition, the Grant tire a success, was the discovery that you could hold the tire in place and fixed upon its base by straining the wires to a clamping point, indicated by a straining just this side of the breaking point of the wire. This was a new discovery and was not known to Grant or suggested in his patent, or practiced by him or others until some time after the date of his patent, and when known this complainant and Grant changed to this method and abandoned the old method of completing and jumping on their tires.

This fact is shown in the certified copy of Grant's deposition of ten years ago, where Grant testified as follows, upon cross-examination (Rec., 649-50):

> "X-Q. 52. Did you at any time change your method of putting on tires? If so, when?
>
> "A. I can't say that we changed the method of putting on the tires farther than to adopt a plan to put them on as tightly as possible, tighter than we usually did when first putting on these tires. That plan was adopted I think some time in the middle of last year.
>
> "X-Q. 53. Do you mean by that that it was put into practice by the middle of last year?
>
> "A. It was about one year ago that we decided that what trouble we were having with the tire was caused by it being put on too loosely. *We at that time decided to put them on as tight as possible* and from that time watch this feature of the business a great deal closer than

before, *and I expect it would be said we adopted it at that time.*"

"X-Q. 55. Prior to the time you adopted the new plan did you first form the tire into a hoop, and afterwards seat it in the channel by stretching it over the flange with tools for that purpose?

"A. I would rather not answer that question for the same reasons given in my last answer.

"X-Q. 56. Do you decline to answer?

"A. I do."

Grant further testified as follows (Rec., 650-1):

"X-Q. 58. In your new plan of applying tires do you draw up the wires in the flanges and fasten them without throwing or stretching them over the flanges after the ends of the wires are united?

"A. I decline to answer that question."

It is curious that the patentee Grant, ten years ago, refused to state, not only whether or not in applying his tires he completed the tire and then jumped it over into the rim, or whether or not, in his admittedly new plan of applying his tires, by wiring he did so by stretching the wires and fastening them after the tire had been placed in the channel rim. This position of Grant at that time can mean nothing except that the patent disclosed nothing as to wiring the tires in so as to prevent the tipping action, either by first forming the tire and jumping it into the rim, or stretching the wires after the tire was in position. Whichever way you look at it it is perfectly evident that the Grant patent gave no instructions as to this matter and that Grant himself knew no other method of putting on

a tire under his patent, except to complete it and then jump it on over the rim—until a year or two after the patent grant.

There can be no doubt that the metal rim, rolled in final form, and produced expeditiously and accurately, and now as a common article of commerce, is one of the main factors in the adoption and use of the tire of the Grant patent. The patentee Grant had to require the special construction of this rim, and did not know of its existence at the date of his patent. (Rec., 608; X-Qs. 136-7.) It is not now disputed that this channel rim was old in the tire art long before the date of Grant's invention, as evidenced by several patents in suit, principally Willoughby.

The question of the improvement of the rubber itself—the wide advertising of the tire, and the pushing and exploiting of the tire, by the complainant, is recognized in the opinions of the Courts of Appeal as a marked factor in the adoption of the tire; taken in connection with the advanced wealth of the country, and the demand of the public for easier riding vehicles with rubber tires.

The statement found in the opinion of the Court of Appeals of the Sixth Circuit clearly recognizes these facts, and gives the reasons therefor as follows (116 F. R. 377):

> "Much stress has been laid upon the commercial success of the Grant tire. Aside from the fact already mentioned, that much of the durability of the tire is due to the better quality of the rubber used, there is much evidence that this success is to be largely attributed to

the power of great capital in buying or crushing out rivals, and to great business push and advertising. There is too much evidence in this record as to consent decrees against rival makers of tires to predicate much upon the mere fact that the Grant tire has met with a large sale."

The rule of law to prevail in this case—under Kessler v. Eldred, 206 U. S. 285.

It appears by the undisputed record in this case that this Grant patent has been declared invalid in a case of these same complainants against the Goodyear Tire and Rubber Company and the Victor Rubber Tire Company, two distinct corporations and manufacturers, in two separate suits, in the United States Circuit Court of Appeals of the Sixth Circuit, and has been declared invalid in the United States Circuit Court for the District of Indiana in the Seventh Circuit in a suit against the Kokomo Rubber Company. In view of these facts, the court so held and decreed that the injunctional order in this case did not and was not intended to enjoin the defendants from handling and selling the rubber tire made by either of the three defendants above identified, the injunctional order of decree of the court as to this matter being as follows (Rec., 693-4):

"Nothing in this injunction shall prevent or is intended to prevent or enjoin this defendant from handling, using and selling rubber tires and rims covered by the Grant patent, manufactured by the Goodyear Tire and Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the federal courts of the Sixth Circuit; or man-

ufactured by the Kokomo Rubber Company, having a right to manufacture, use and sell such tires under a judicial decree in the District of Indiana, Seventh Circuit; or manufactured by the Victor Rubber Tire Company, under a judicial decree in a litigation in the federal courts in the Sixth Circuit, wherein in such litigations it has been judicially determined that the said Grant patent is invalid and void."

It is respectfully contended that this order should have been substantially broader, and that this petioner appellant should not have been enjoined from the handling or sale of tires manufactured in the Sixth or Seventh Circuits and there purchased by this defendant; or otherwise stated, this Grant patent has been judicially declared invalid in the Sixth and Seventh Circuits and every manufacturer having a right to manufacture, use and sell the tire of the Grant patent in those circuits, and this or any defendant purchasing these tires in either of those circuits have a right to sell them anywhere in the Second Circuit or in any other of the nine circuits, and for this reason no injunction whatever should have been granted against this petitioner appellant; no proof being present of either the handling, use or sale by this petitioner appellant of any rubber tire, other than purchased by this petitioner appellant in the Sixth Circuit, therefore this suit must fail. It would seem that the case of *Kessler* v. *Eldred, supra*, barred any further action, claim or suit against rubber tires made and sold in the Sixth and Seventh Circuits. Otherwise stated, these tires having been once rightfully and lawfully made

and sold in the Sixth and Seventh Circuits, cannot be followed and sued as infringements of this Grant patent in another circuit. The authorities are abundant as to the proposition that a patented device rightfully manufactured and rightfully sold in a territory where such manufacture is lawful, can be sold elsewhere, even in a territory owned, as to a patent, by a third party. By reason and analogy it would seem, under the authorities, that, the rubber tires in this case proceeded against as an infringement in the Second Circuit, having been rightfully manufactured and sold in the Sixth Circuit, there is no restriction upon their use or sale in any other circuit, and we so respectfully submit.

BRIEF AND ARGUMENT—AUTHORITIES.

I.

The statutes have determined, as a condition precedent imposed upon the applicant and prospective patentee, before a patent shall be granted him, that he shall comply with such statute reading as follows (U. S. Revised Statute):

> "In the case of any machine, he, the patentee, shall fully explain the principle and the best mode or method in which he has contemplated the application of that principle or character by which it may be distinguished from other inventions, and shall particularly specify and point out the particular improvement or combination which he claims as his invention and discovery."

II.

In all cases where his claim is for an improvement on a machine, it will be incumbent upon him to show the extent of his improvement so that a person understanding the subject may comprehend distinctly of what it consists.

Evan v. *Heaton,* 3 Wheaton 454.
Grant v. *Raymond,* 6 Peters 248.
Gill v. *Wells,* 22 Wall. 25.

III.

A failure on the part of the patentee in those perquisites of the act which authorize a patent is a bar to a recovery in an action for its infringement, and the validity of the defense does not depend on the invention or the inventor, but is a legal inference from his conduct.

Grant v. *Raymond,* 6 Peters 248.

IV.

The specific claim of a patent is notice to the world of the most public and solemn kind, that all those parts of the machine or manufacture set out and described in the specification, and not embraced in such specific claim—is not claimed by the patentee, and is not his invention, or if so, has thus been surrendered to the public.

Mahn v. *Harwood,* 112 U. S. 360.

Fay v. *Cordesman,* 109 U. S. 421.

Keystone Bridge Co. v. *Phoenix Iron Co.,* 92 U. S. 274.

Merill v. *Yeomans,* 94 U. S. 568.

White v. *Dunbar,* 119 U. S. 51.

V.

Where the patent is for an improvement and clearly identifies the invention, which invention is set forth in the claim, and where such claim is clear and explicit, as well as the specifications, neither

court nor counsel are required to go into and examine the old art and the patentee must abide by his claim.

LeRoy v. *Tatham*, 14 How. 156.
James v. *Campbell*, 104 U. S. 356.
Mahn v. *Harwood*, 112 U. S. 360.
Fay v. *Cordesman*, 109 U. S. 421.
Keystone Bridge Co. v. *Phoenix Iron Co.*, 92 U. S. 274.
Merill v. *Yeomans*, 94 U. S. 568.
White v. *Dunbar*, 119 U. S. 51.
Burns v. *Meyer*, 100 U. S. 671.
Machine Co. v. *Lancaster*, 129 U. S. 263.
Snow v. *Railway Co.*, 121 U. S. 629.

VI.

The construction of the patent is governed by the claim. A claim must be construed by its terms when they are clear and cannot be enlarged.

Railroad Co. v. *Sayles*, 97 U. S. 554.
Railroad Co. v. *Mellon*, 104 U. S. 112.
Yale Lock Co. v. *Greenleaf*, 117 U. S. 554.

VII.

The burden of proof is always upon the complainant and never shifted to establish the fact of infringement.

Seymour v. *Osborne*, 11 Wall. 516.
Fuller v. *Yentzer*, 94 U. S. 288.
Imhauser v. *Buerk*, 101 U. S. 647.
Agawan v. *Jordan*, 7 Wall. 583.

VIII.

The rubber tire of the petitioner appellant having been rightfully made and rightfully sold in the Sixth Circuit, where and after the Grant patent had been declared invalid, as appears in the cases, *supra,* the petitioner appellant has full right to handle, use and sell said tire so purchased, in the Second Circuit:

> *Kessler* v. *Eldred,* 206 U. S. 285; *Adams* v. *Burke,* 17 Wall. 453; *Birdsell et al.* v. *Shaliol,* 112 U. S. 487; *Hobbie* v. *Jennison,* 149 U. S. 354; *Wade* v. *Metcalf,* 129 U. S. 202; *Boesch* v. *Graff,* 133 U. S. 697; *Keller* v. *Standard Folding Box Co.,* 157 U. S. 659.

IX.

Where the old art is crowded and replete with close approximations to the invention of an asserted patent, it is a saving of labor and time of court and counsel to select and compare the closest approximation to the asserted invention of the patent, for if these close approximations do not anticipate the invention, certainly none of the others so do, and if they do so anticipate or so closely anticipate the inventions of the patent in suit, as to its pretended novelty, it is immaterial whether the other old patents do or do not.

> *Topliff* v. *Topliff,* 145 U. S. 160.

X.

The general use and adoption of a patented article, as affecting patentable novelty or invention, is without probative force, especially if it is shown that large capital and extensive advertisement can account for such general use.

McClain v. *Ortmayer,* 141 U. S. 419.
Watch Case Co. v. *Robbins,* 75 F. R. 17.
Lane v. *Welds,* 99 F. R. 286.

Conclusion.

In conclusion, your Honors, your petitioner respectfully submits that the writ of *certiorari* being granted and the full record of this case being now before this court for final review and determination, and the case having been fully heard upon the merits, that upon such hearing so had there is a clear right in the petitioner to the end and purpose that the decrees and findings of the trial courts shall be reversed and the cause remanded, and the bill of complaint herein dismissed at complainant appellees' costs as without equity.

Respectfully submitted,

CHARLES K. OFFIELD.

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SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1910.

No. 36.

DIAMOND RUBBER COMPANY OF NEW YORK,
PETITIONER, DEFENDANT,
v.
CONSOLIDATED RUBBER TIRE CO. ET AL.,
RESPONDENT, COMPLAINANT.

BRIEF FOR RESPONDENT, COMPLAINANT.

STATEMENT OF THE CASE.

This cause is brought by writ of *certiorari* to this Honorable Court from the United States Circuit Court of Appeals for the Second Circuit, whose decision affirmed Judge Holt's decree in the United States Circuit Court, Southern District of New York, holding the Grant patent No. 554,675 valid and infringed.

The patent to Grant in suit is for a "Rubber-Tired Wheel", which, since the date of its invention early in April, 1894, has achieved absolute supremacy for use on wheels of horse-drawn vehicles of the lighter type, such as carriages for commercial and pleasure use, cabs, delivery wagons and the like, the wheels of which are subjected to rough use on city streets.*

The Grant tire was the first commercially successful "solid rubber" tire. It has the distinction, almost unique

*The broad, low, flat, solid rubber tires which have recently gone into use on heavy auto and other trucks do not involve the invention of the Grant patent.

among inventions, of having been introduced into use in the exact specific form shown and described in the patent even in matters of shape and minute detail. Prior to the invention, there has been no solid rubber tires in use on vehicles except occasionally and in an experimental fashion. The Grant tire immediately took the market and from the time of its introduction to the present day it has been the only useful solid rubber tire for the lighter vehicles such as carriages, etc. As we shall show hereafter, no tire that did not copy that of the Grant patent has proved even serviceable for the particular class of vehicles for which the Grant tire is adapted. The patent has been extensively infringed in spite of the most strenuous efforts on the part of the owners of the patent to enforce their rights. There have been repeated decisions sustaining the patent. There has been every temptation for those who would manufacture tires to find some other construction. The interest of such outside manufacturers to evade the patent by departing from some of the details of the patented arrangement has been the greatest possible. The claims are so specific that there was every temptation to try to evade them; but every single infringer has copied the structure set out in the claims in the most slavish fashion.

These considerations are certainly significant. Why is it that there should have been no commercially successful solid rubber tire, either before or since the date of Grant's invention, except his tire and tires that are practically Chinese copies of the construction, shape and arrangement shown in his drawings and specifically set out in the apparently narrow claims of the patent? There can be but one answer to this question. *The patented organization must be one that is essential. Its use in the precise form described and shown in the patent must be inevitably necessary.* Later in the brief we shall show why it is that such is the case.

For several generations it has been recognized that

rubber tires for vehicles would be a most useful improvement, if a proper tire could be devised. It is no exaggeration to say that the use of such tires, which is now most extensive, adds enormously to the comfort of those who ride. More than that, the presence of the rubber tire results in substantial economy, for the wear and tear of vehicles is nothing like as great when there is a cushion between them and the roadway, reducing to a large extent the jar, pounding and shock which is so destructive to vehicles that have no rubber tires. But the problem was obviously one of the greatest difficulty, as is shown by the large number of patents prior to Grant, none of which show or suggest structures that went into use on horse drawn vehicles.

Rubber tires first went into general use on bicycles. Here the problem was extremely simple. A bicycle has one wheel following the other. Its track is in width only that of the wheel. The rider picks his way, avoiding stones and obstacles, keeping out of the street car tracks and ruts, and generally selecting from moment to moment, for the path of his wheel, the best spot on the road. If he was not careful so to do, he would be very sure to fall.

In the case of vehicles having four wheels, the situation is very different. The driver does not and cannot give anything like the same attention to the path he takes as can and does the bicycle rider. More than that, the vehicle has a pair of wheels on each side, and if the utmost pains were taken to select the best path on the roadway for the wheels on the left-hand side of the vehicle, those on the right-hand side might be in serious trouble. If a smooth track were selected for those on the right-hand side, those on the left-hand side might be advancing on or over the edge of a street car track, over the corners of cobblestones, in a gutter or rut, or over an obstacle of substantial size in the highway.

The tires of bicycles were for many years of solid rubber

and strongly cemented to the rim. The only pressure on those tires was the vertical pressure between the bicycle and the roadway. There was no lateral strain on the tires.*

With horse drawn vehicles, however, except in rare instances where there is a perfectly smooth roadway, there is constantly the most violent lateral strain, first in one direction and then in the other, on the projecting solid rubber tires. On ordinary highways the conditions are such that very frequently a cobblestone or of an obstacle in the road, the edge of a Belgian block, the rail of a street car track or a rut, may bear against the side of the exposed portion of the rubber tire with a tremendous lateral strain, due not only to the weight of the vehicle but to the pull of the horses. Under these conditions there is the greatest danger that the tire will be forced off the wheel, which results in disabling the vehicle. The history of the solid rubber tire shows that there is no method of attaching it to a wheel which *in and of itself* is strong enough to overcome this danger. A great merit of the Grant invention is that it does not rely merely upon the strength and rigidity of the attachment. His tire is *not* rigidly attached to the wheel. On the contrary, it is flexibly attached. It is in a sense a floating tire because it is flexibly attached and as it were "floats". For this reason, largely, it met the difficulties of the situation. It is, to be sure, strongly held on the wheel by a peculiar fastening consisting of two tightly drawn wires embedded in the rubber and united at their ends. But these two wires are effective as holding contrivances only because of the peculiar shape of the parts, and the specific arrangement of the construction as a whole and the relation of the several parts to each other. The

*Afterwards inflated pneumatic tires were extensively used on bicycles and the tires employed today on automobiles are pneumatic. Substantially all the lighter horse-drawn vehicles, however, have the solid rubber tires, to which alone the Grant patent relates; and they are all of the Grant form and construction.

Grant patent is for a *combination*, an *organization*, in which by reason of the special form and shape of the elements, their refined relation, each to the other, and their intelligent and novel correlation, the important result of the first and only practicable solid rubber tire has been realized.

As early as 1898, but two years after the issue of the Grant patent, Judge Thomas in the suit of *Rubber Tire Wheel Company* v. *Columbia Pneumatic Company*, 91 Fed. 978, sustained the Grant patent against every prior patent and prior reference which is now urged upon this Court as ground for invalidity. Not a single new prior reference of the least importance has appeared since this first case except the Latta patent, which was effectively disposed of as an anticipation by the Court of Appeals for the Second Circuit in the *Firestone Case*, 151 Fed. 237, and which is not relied on by the defendant in this case with any force.

The Grant patent has also been sustained in the following cases:

Consolidated Rubber Tire Co. v. *Finley Rubber Co.*, Newman, J., 116 Fed. 629;

An unreported case decided by Judge Wing, referred to by Judge Newman in the above cited case;

Consolidated Rubber Tire Co. v. *Firestone Tire & Rubber Co.*, Platt, J., 147 Fed. 739;

Same case on appeal, Circuit Court of Appeals for the Second Circuit, 151 Fed. 237 (known as the Firestone case).

The Grant patent was also sustained by Judge Holt in the case at bar in the Circuit Court (Rec. p. 671) and by the Circuit Court of Appeals for the Second Circuit (162 Fed. 892 and Rec. pp. 683–693).

In *Rubber Tire Wheel Co.* v. *Milwaukee Co.*, 154 Fed. 359, the patent was also involved and assumed to be valid.

The patent was held invalid by the Court of Appeals for

the Sixth Circuit in *Goodyear Tire and Rubber Co.* v. *Rubber Tire Wheel Co.*, 116 Fed. 363, and again by the same court in the Victor case, 123 Fed. 825. This decision was followed by Judge Anderson in the Seventh Circuit by dismissing the suit known as the Kokomo case (unreported).

When the Grant patent was before the Court of Appeals for the Second Circuit in the Firestone case, 151 Fed. 237, that Court had before it the decisions of the Court of Appeals for the Sixth Circuit holding the patent invalid. In this case the Court of Appeals for the Second Circuit said (p. 239):

> "It now appears that the feature which secures patentability is inherent in the patent, and the specification is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature is neither an accident nor 'an obscure property'; it exists in every wheel on which is mounted a tire which follows the teaching of the patent. In view of this new aspect of the case *we have no reason to doubt that on the present record the Court of Appeals of the Sixth Circuit would reach a result favorable to the patent.*"

The record in the Firestone case is by stipulation made a part of the record in this case before this Court. It supplies the facts for the lack of which the Court of Appeals for the Sixth Circuit in the Goodyear case thought the patent invalid.

On the record presented to this Court there have been no differences of opinion as to the validity of the Grant patent.

As Judge Coxe, speaking for the Court of Appeals for the Second Circuit in this case, well said (162 Fed. 893, Rec. p. 683):

"Another volume of 500 pages has been added to the library which has accumulated during the last ten years through the efforts of many defendants who seem determined to use what they, in effect, assert to be a useless device. The indomitable persistency with which these people have fought for the right to use the Grant tire is more persuasive evidence of its merits than the opinions of experts."

No manufacturer of solid rubber tires has ever been able to escape the burden of litigation under the Grant patent by the simple expedient of evading the claims of the patent.

THE GRANT PATENT.

We have inserted a copy of the Grant patent at this point in the brief, and request the court to read the patent, as it is short and simple and clearly describes the exact construction of the Grant tire, which, since the date of its introduction to the commercial world in 1894 as the Kelly Springfield tire, has proved the only satisfactory tire of its class.

One of defendant's witnesses, in the livery business in New York for forty years, said, page 504:

"It is like the telephone, you can't do without them."

THE GRANT TIRE.

The Grant tire is composed of three elements; First, the channel; second, the rubber tire, and third, the fastening device. It is the specific shape and the arrangement and inter-relation of these parts among one another, exactly as described and shown in the patent, which give the tire its vitality and wonderful usefulness. There has been substantially no departure from this specific shape and definite organization in any solid rubber tire for the lighter type of horse drawn vehicles which has ever gone into successful commercial use.

(No Model.)

A. W. GRANT.

RUBBER TIRED WHEEL.

No. 554,675. Patented Feb. 18, 1896.

Fig 1

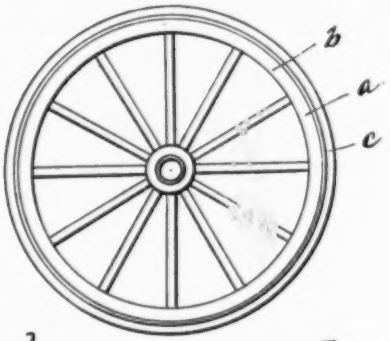


Fig 1c

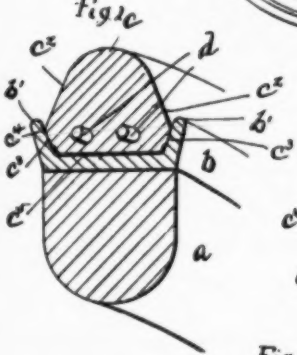


Fig 4.

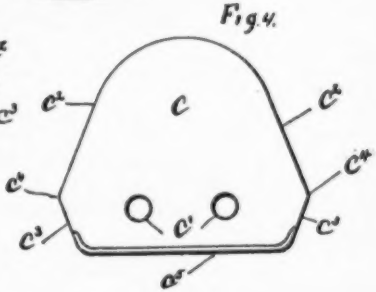
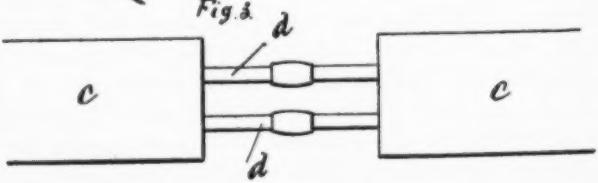


Fig 3.



Witnesses
Chas. J. Walch
F. L. Walker

Inventor
Arthur W. Grant
By his Attorney
Chas. A. Walch

UNITED STATES PATENT OFFICE.

ARTHUR W. GRANT, OF SPRINGFIELD, OHIO.

RUBBER-TIRED WHEEL.

SPECIFICATION forming part of Letters Patent No. 554,675, dated February 18, 1896.

Application filed November 14, 1895. Serial No. 568,923. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. GRANT, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Rubber-Tired Wheels, of which the following is a specification:

My invention relates to improvements in rubber-tired wheels, and it especially relates to wheels designed for use on ordinary vehicles, such as wagons, buggies, and carriages.

My invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a wheel embodying my invention. Fig. 2 is a sectional elevation of the wheel-rim, shown partly in perspective. Fig. 3 is a partial longitudinal section through the tire, showing the openings for the retaining-wires. Fig. 4 is a transverse sectional view of the rubber tire in detail.

Like parts are represented by similar letters of reference in the several views.

In constructing my improved rubber tire, I take an ordinary vehicle-wheel preferably with a plain wooden felly *a*, and to this wooden felly *a* I secure a metallic rim *b*, having at its edges outwardly-projecting flanges *b'*. These flanges *b'* extend outwardly from the rim *b* at an angle, so as to form a groove or channel having tapered or beveled sides, with the bottom of said groove or channel smaller in cross-section than the top. In this groove or channel I place a rubber tire *c*, which is of peculiar shape. This rubber tire is formed preferably of a single piece, but not continuous. It is provided throughout its length with openings c' c', through which are passed retaining-wires *d*. These retaining-wires are separate and independent and extend entirely through the openings c', and the ends of each of said retaining-wires are united together after the rubber has been compressed endwise on said wires, thus forming two independent and continuous retaining-wires within the rubber tire, the ends of which, by reason of the compression, are brought together so as to entirely cover the wires and the united ends thereof.

The tire proper, *c*, is formed of substantially the same depth as width. The outer periphery, however, is formed on the arc of a circle of much smaller diameter than the width of the rim, the exposed sides of the tire being formed preferably on the lines c^2 at an angle to each other and also to the flanges b' of the wheel-rim. The unexposed portion of the tire, or that portion which is inclosed within the rim, is formed of substantially the same shape as the inner channel of the rim — that is to say, it is tapered from the outside inwardly — so that the sides of the inner or unexposed portion of the tire are also formed on the lines c^3, forming with the lines c^2 an obtuse angle. The lines c^3, however, are less in length than the inside of the flanges b', so that the angle or corner c^4 between the sides c^2 and c^3 falls below the outer periphery of

the flange b' and within the channel between said flanges. The openings c' through which the retaining-wires pass are also formed within the inner or unexposed portion of the tire—that is to say, the tops of the openings are substantially on a line with the angle or corner c^4, so that the tops of said openings stand below the outer periphery of the flanges b'.

The bottom portion of the tire is reinforced with a canvas strip c^5, which covers the entire bottom and may project slightly along the sides c^3, but does not in any case extend up as far as the angle or corner c^4.

The tire has been described thus minutely because the constructions described are important. By having the sides of the exposed and unexposed portion of the tire formed inclined and at an angle to each other, as described, the compression of the tire in use is such that all portions of the rubber are retained within the channel or groove and no portion of the rubber is forced over the side of the flange, which would result in cutting or grooving the tire at the corner or angle, which would eventually cause the tire to break from this point inwardly to the openings c'. The reinforcing of the bottom of the tire by the canvas strip, which may be formed into the rubber, is desirable, as it has a tendency to prevent the breaking of the rubber below that portion of the tire which is between the retaining-wires and the rim. At the same time, by having the canvas strip wholly within the rim, all danger of stripping the edge of the canvas from the rubber, which would eventually result in a fracture of the rubber to the opening c' is prevented.

It has been found in practice that by the constructions above described I produce a rubber-tired wheel-rim which is capable of more use and which will remain in position better than any other tire which has ever been put upon the market.

Having thus described my invention, I claim,—

1. A vehicle-wheel having a metallic rim with angularly-projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining-wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

2. A vehicle-wheel having a metallic rim with outwardly-projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining-wires in said openings, and a reinforcing-strip of fibrous material placed at the bottom of said tire and wholly within said flanges, substantially as specified.

In testimony whereof I have hereunto set my hand this 7th day of November, A. D. 1895.

ARTHUR W. GRANT.

Witnesses.
W. S. HUFFMAN,
E. P. CHRISTIE.

The channel b is provided with two outwardly flaring flanges, b^1.

The bottom of the tire c rests on the bottom of the channel and the flaring sides of the rubber seat against the flaring flanges of the channel, but do not extend to the periphery of the flanges. The angle of the tire at c^4 is an obtuse angle. The part c^3 below that angle is the inner or unexposed portion, and the part c^2 above the angle is the outer or exposed portion. The tire is provided at its bottom and partially on the sides of the inner portion with a strip of canvas, c^5, for the purpose of giving added strength.

The fastening device consists of two wires, d, passing through holes, c^1, in the tire, the wires d lying below the outer periphery of the flanges of the channel, and hence within the inner or unexposed portion of the tire.

In actual commercial practice the rubber tire is applied to the wheel by wrapping around the wheel and in the channel a length of tire with the two wires, of a length suitable to surround the wheel, enclosed in the holes therein. The ends of the rubber are pressed back and the wires drawn together either by hand or by machinery as tightly as possible. The ends of the wires are secured together, usually by welding or brazing. The ends of the rubber are then forced back over the wires so as to meet and form a continuous annular tire. (Ernenwein, Rec. p. 51, Q. 16; Roberts, p. 58, Q. 19.)

The two claims of the Grant patent, both of which are in issue, accurately define the Grant structure, and are as follows:

> "1. A vehicle-wheel having a metallic rim with angularly-projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle

to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining-wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

"2. A vehicle-wheel having a metallic rim with outwardly-projecting flanges at an angle to the plane of said wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining-wires in said openings, and a reinforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges, substantially as specified."

These claims of the Grant patent are narrow claims, limited closely to the specific construction of the Grant tire as it is actually shown and described in the patent. We do not ask this Court to broaden the claims of the Grant patent or to apply the doctrine of mechanical equivalents. No such question arises in this case. The defendant's tire follows line for line the details of the Grant tire.

How vital are the details of the construction of the combination of the elements of the Grant patent is shown by two facts: First, the failure of the many tires prior to Grant which did not have the combination of the Grant patent; and, second, the fact that the only tires subsequent to Grant which have been successful or even useful are tires which have copied the Grant tire in the specific details of construction. All others have been failures.

COMPLAINANT'S DIAGRAM OF RUBBER TIRES.

We call the Court's attention to the "Complainant's Diagram of Rubber Tires", which on the left-hand side shows the entire art prior to Grant's invention which is disclosed in the Record; in the middle are shown the tire of Grant's patent and the defendant's tire; and on the right-hand side is shown the entire art subsequent to Grant's invention, that is to say the tires since the Grant patent which, according to the record, have been used or attempted to be used.

In this diagram of the prior art there are shown the rubber tires of twenty-five prior patents. None of these ever went into use to any appreciable extent; there were practically no solid rubber tires on horse drawn vehicles prior to the Grant invention.

It is admitted by complainant's experts and counsel that there is no one patent in this prior art which shows or describes the combination of elements found in the Grant patent. The prior patents show almost every conceivable form of channel, shape of tire and method of attachment, except the right combination, which was first discovered by Grant. All kinds of channels are shown: some with inwardly converging flanges; some with perpendicular flanges; some with outwardly flaring flanges; some with curved flanges; some with straight flanges and some with no flanges at all. Tires of all kinds of cross-sectional shapes are shown in the prior art: circular; semi-circular; elliptical; triangular; heart-shaped; V-shaped; square; horse-shoe shaped; wedge-shaped and flat. Many kinds of fastenings are shown for holding the tire rigidly in its channel. The principal fastening is cement, and in some cases metal bands or wires are used in addition to the cement. But in no case is Grant's combination of specific channel, rubber and two wires, as shown in the Grant patent, found in the prior art.

No one asserts that any one of these prior tires is of any commercial value. There is not one such tire on the market today. They have all proved failures and then displaced by the Grant tire.

Turn now to the "subsequent art" on "Complainant's Diagram of Rubber Tires". Here are shown some eighteen forms of tires. Of these the Kokomo No. 1, Firestone No. 2 and No. 14, Goodyear No. 3 and No. 4, Victor No. 5 Hartford No. 6, Morgan & Wright two-wire tire No. 8, Batavia No. 9, American No. 10, Inter-national No. 12, Wemaka two-wire tire No. 13 and Standard No. 15 are copies of the Grant tire and are in commercial use today.

The New England tire No 7, the Morgan & Wright band tire No. 11, the Whitman & Barnes tire No. 16, the Calumet No. 17 and the Wemaka tire, with a single wire, No. 18, are each different from the Grant tire in some vital respects, and the use of each has been abondoned and the tire of the specific form shown in the Grant patent has been substituted in its place. Nothing has succeeded except the precise Grant construction following every detail set forth in the claims of his patent.

THE SUPREMACY OF THE GRANT TIRE.

The history of rubber tires for horse-drawn vehicles is given by Van Cartmell, record, page 773, in a deposition given in the Firestone case and made part of this record by stipulation. The deposition is short, and as it gives clearly the history of the development of the Grant tire and the failure of its competitors, we ask the court to read it. Mr. Van Cartmell has been in the rubber tire business continuously since the fall of 1894.

On cross-examination he makes the following significant statement (Rec. p. 777):

> "X-Q. 28. In other words, practically all of the manufacturers of rubber tires in the country are and

have been substantially, ever since the decision of the Circuit Court of Appeals in the Goodyear case, making tires which you consider come within the Grant patent. Is that so?

A. Yes, sir."

This is not denied by the defendant.

All efforts to make a tire for use on the class of vehicles for which the Grant tire is adapted, which is not the Grant tire, have been abandoned, as shown by Mr. Van Cartmell in answer Q. 8 to Q. 20.

The Whitman and Barnes tire (No. 16 in the group marked "Subsequent Art" on the "Diagram of Rubber Tires") was substantially the first tire to compete with the Grant tire. As described by Mr. Van Cartmell, the rubber was cemented in the channel, and an attempt was made to hold it there by a single wire. At first it had some success because of its neat appearance, but it was found that —

> "within a few months the rubber would separate from the metal and as soon as it started to separate, say, a few inches, it was then a matter of but a few hours if the wheel was in use when the tire would be off." (Van Cartmell, Rec. p. 774.)

The Whitman and Barnes tire was abandoned after eight or ten months' use, although it was extensively advertised and pushed in New York, Brooklyn and Boston.

Other forms of tires in which it was attempted to avoid the Grant patent by the use of single bands as fastening means, instead of two wires, as in the Grant tire, were the New England tire (No. 7) and the Morgan & Wright tire (No. 11). Both of these tires proved failures in actual use and disappeared from the market. (Van Cartmell, Rec. p. 775.) Another form of tire with a single band fastening was the Calumet (No. 17), but the method of application failed to give satisfaction and its manufacture was given up. (Van Cartmell, Rec. p. 776.)

The Wemaka tire No. 18, with a single wire for a fastening, was also soon abandoned. (Van Cartmell, Rec. p. 776.)

An effort was made by the American Company to avoid the Grant patent by the use of a tire in which the rubber had a lip extending over the flange of the channel. It was called "The American Lip Tire". (See diagram, Rec. p. 791.) This tire went to pieces within a few weeks, not to exceed three or four in some cases, and the tire has disappeared from the market. (Van Cartmell, Rec. p. 775.)

The American Company also tried to avoid the Grant patent by raising the wires above the shoulder or angle between the inner and outer portions of the tire and above the periphery of the flanges.

> "This tire, as I remember it, proved a failure within a few months, and the wires or holes were again placed within the periphery of the channel." (Van Cartmell, Rec. p. 775.)

The Revere Rubber Company made a tire known as the "Langmuir Tire", in which it is attempted to avoid the Grant patent by making the sides of the rubber straight, or, in other words, dispensing with the formation of the corner or angle of the rubber near the top of the flange, but still using the retaining wires and flaring channel iron. As this tire was widest at the bottom, it left a V-shaped space between the channel and the rubber on either side. The manufacture of this tire was abandoned in 1901, and it has not been on the market since. (Van Cartmell, Rec. p. 776.)

The absolute supremacy of the Grant tire is also proved by the defendant's witnesses produced both in the Firestone case and in the case at bar.

Harvey S. Firestone, the president of the Firestone Company, testified in 1905 that the Grant tire "did represent the prevalent form of internal wire tire" (Rec. p. 851, X-Q. 25), and that a tire "of this style was sold very

largely" and "known as the Kelly Springfield tire" (X-Q. 26). He also admitted that the Calumet Rubber Tire Company "have entirely given up the manufacture" of the Calumet tire, and he further testified as follows (Rec. p. 853):

> "RD-Q. 36. And is it not a fact that practically all manufacturers of solid rubber tires in this country are making and selling tires with two internal wires and substantially like the 'Complainant's Exhibit Kelly Internal Wire Tire'?
>
> A. To the best of my knowledge they are."

The defendants in this case and in the Firestone case produced many hack men and livery stable keepers, who have had experience in the use of rubber tires on horse drawn vehicles. They all testify to the universal use of the Grant tire and the abandonment of all other kinds of tires. We quote from the testimony of defendant's practical witnesses:

THOMAS G. BRODERICK, Rec. p. 232:

> "I should judge it is about eleven years ago when we commenced to put on the Kelly tire; that was the first we put on."

Rec. p. 246:

> "X-Q. 106. What became of the Hartford one-wire tire?
>
> A. They discarded that and made a two-wire."

Rec. p. 247:

> "A. Yes, I know they all quit the flat band and all other types of single wire.
>
> X-Q. 108. Except like the Kelly tire?
>
> A. Yes, that is the only tire there is now with two wires, the same as the tire in suit."

OMAIRE J. DUHAMEL, Rec. p. 264:

"A. No, sir; but prior to that we had tires put on in Boston by the Boston Rubber Company, and they were cemented on, and those were the first tires we put on.

X-Q. 38. Prior to when?

A. 1899.

X-Q. 39. And when did you abandon the cemented-on tires?

A. About three years later."

Rec. p. 265:

X-Q. 48. *Did you abandon the use of the cemented-on tires because they were unsatisfactory?*

A. *Yes, sir.*"

LOUIS KUEHNE, Rec. p. 281:

"X-Q. 37. Was that a tire known as the 'English or clincher tire', and handled by Kimball and some large concerns in Chicago?

A. That is the one I referred to.

X-Q. 38. When was that?

A. About '91 or '92.

X-Q. 39. When did the tire cease to be handled in Chicago, before or after the Rubber Tire Wheel Company started?

A. I can't say as to that. *I don't think there was any more of those tires used after the Rubber Tire Wheel Company's product was put on the market.*"

CHARLES F. HUDSON, Rec. p. 283:

Ans. to Q. 5. "My first experience with the solid tire was with the International Vehicle Tire & Rubber Company, of New York City, with a solid tire that fastened through the felloe. We made an application

of this tire for about two years and *discontinued it then on account of the fastening not being successful. We changed from this tire to the two wire internal fastenings.*"

Rec. p. 286:

"X-Q. 29. There was testimony in the Kokomo case about this tire and the following statements were made by a witness by the name of Jacobs: 'What was your experience with the *Peoria clincher tire?* A. *It gave very poor satisfaction.* Q. What was the trouble with it? A. The rubber split where the tire clinched it and rolled off'. Does this conform with your recollection as to your experience with the Peoria clincher tire?

A. It certainly does."

Rec. p. 288:

"X-Q. 43. You spoke of this International fastening not being successful. Do you remember what the chief objections were?

A. They could not apply the rubber tight enough with a band and *the fastening was entirely unsatisfactory.*"

FRED M. MECKEL, Rec. p. 363:

"X-Q. 28. Did you ever use any Morgan & Wright band tires?

A. Yes, sir.

X-Q. 29. They have gone out of use entirely, have they not, as far as you know?

A. I have not used any for a great many years. *As far as I know, they have gone out of use.*"

JACOB E. HANSON, Rec. p. 422:

"X-Q. 41. Was this English tire that you bought of Kimball what was known as the clincher tire?

A. Yes.

X-Q. 42. Those clincher tires didn't stay long on the market in this locality, did they?

A. No.

X-Q. 43. *The internal two-wire tire drove them out, did they not?*

A. *Yes, sir; they did.*"

JAMES W. PITNEY, Rec. p. 485:

"X-Q. 21. Was it what was known as the English or clincher tire which was held on by clinching the sides of the flanges in against the rubber?

A. Yes, sir.

X-Q. 22. This old form of tire has been supplanted by this new form of tire (the Grant) has it not?

A. Yes, sir."

FRANK P. STONE, Rec. p. 523:

"X-Q. 51. Were you acquainted with the rubber tires (I refer to the forms of solid rubber tires) that were in use in the City of Chicago prior to the introduction of complainant's tire?

A. For some years prior to my knowledge of complainant's tire, I had made considerable inquiry into the merits of other rubber tires, used in this city and New York, as well as in England and on the Continent. We had received a number of letters from French manufacturers of tires in Paris, urging us to adopt their tire, showing illustrations of numerous methods of securing the rubber to the wheel. I made it my special endeavor on one of my trips to New York to look into the merits of the various tires then in use and the result of my investigation was that rubber tires were so expensive that they did not warrant their adoption for general use. And I may state further, I

was informed by some of the leading builders that they did not possess sufficient durability to warrant the outlay. This opinion was given me by those who had had considerable experience with them in service. I refer to carriage builders."

WILLIAM S. ADAMS, Rec. p. 541:

"X-Q. 33. Do you ever see that English tire in use today?

A. I haven't noticed it lately within the last two or three years."

CHARLES F. KIMBALL, Rec. p. 546:

Ans. to X-Q. 22. "DuBois has at different times had several patents of tires, the particular one which we made a trial of consisted of two plates of steel with rubber between them, the rubber being compressed and the outer plate of steel coming in contact with the ground."

Ans. to X-Q. 24. "We did not have so much trouble with the rubber in the English tire pulling out of the channel as we had from the constant cutting of the rubber, owing to the fact that this English rubber was elongated when pressed into the channel in place of being offset as on most of the tires now in use, and also from the fact that the rubber was vulcanized to such an extent that it wore away very quickly."

Thus all the witnesses are agreed that all attempts to avoid the Grant patent by change of shape of the flange or rubber, by change of location of the wires and by the substitution of a metal band or any other form of fastening for the two wires located exactly as in the Grant patent have met with failure, and tires embodying these changes from the Grant tire have all disappeared from the market, leaving the Grant tire absolutely supreme. The only tires which

have remained in actual commercial use, as exhibited in the "Subsequent Art" in "Complainant's Diagram of Tires", are Chinese copies of the Grant patent.

THE REQUIREMENTS OF A SOLID RUBBER TIRE.

Why is it that the public, the carriage makers, the carriage repairers and the tire manufacturers have universally and practically exclusively used the Grant tire on certain classes of vehicles? What is there in the tire that makes it the only tire for these purposes to the exclusion of all other tires?

We confidently submit that the reason is because the Grant tire is a new and patentable combination of parts coacting together in the manner of a true combination to produce a new and useful result. It is not simply an aggregation of old elements or parts collected together, each performing its own function in its old way, but this record shows that the parts of the tire enter into combination, each coacting with the other parts and that the combination performs new and useful functions.

It would seem a simple matter to fasten a strip of rubber to the periphery of a wheel and make a solid rubber tire. Upon reflection, it is obvious that such is not the case; moreover the absolute lack of any evidence of any practical use of the rubber tires of some eighty prior patents which have been brought before the courts proves that this is not the fact. (116 Fed. 365.)

A rubber tire must be strong and durable. No tire but the Grant tire is strong enough or durable enough to be of commercial utility.

The requirements of a rubber tire are many.

It must be set into a channel on the periphery of the wheel rim, and the relation of the tire to the channel must be such that the tire when compressed and bent sidewise

shall not escape from the channel and also shall not be cut on the flange of the channel.

Some kind of fastenings are necessary, because the tire, unless provided with fastenings, would be easily thrown out of the channel and off the wheel. The fastenings must be strong enough to hold it in the channel.

The fastenings must be so arranged as not to cut the tire. The tire, therefore, should be thick and substantial at the points where the fastenings are placed.

As a tire rolls along over the ground, it is compressed at a point in advance of its contact with the ground, and this compression causes the tire to "creep" or move slowly around the edge of the rim. Provision must be made for this "creeping".

Defendant's expert witness Pond states (Rec. p. 216):

> "It is a well known fact that in tires of the Grant construction the tires creep more or less around the rim, and the wires creep more or less through the tires."

Lastly and by no means least, the tire must stand those shocks and blows delivered against its side as the wheel is driven rapidly against the car tracks, curbings and other inequalities in the road. The efforts of inventors prior to Grant were directed towards obtaining a fastening, usually in the form of cement, which would hold the tire rigidly and solidly in its channel. Grant showed this to be wrong, and in his tire he adopted a radically new and different plan.

Grant constructed his tire so that it was mobile in its channel, could creep if necessary and would yield laterally, and thus the lateral blows against it would be cushioned. Every one knows how a device which yields to repeated blows is more durable and withstands better those blows than one which is rigid and which, therefore, receives the

full force of the blows. This principle is inherent in Grant's tire and is one of the reasons for its success.

Grant's construction is also such that the tire after having been tipped from its seat in the channel by a side blow automatically restores itself to normal position when the side pressure is released.

This record shows that the Grant tire was the first tire and the only tire to satisfy every requirement of a strong and durable tire. The shape of the rubber in combination with the shape of the channel is such that the rubber when compressed by a heavy load does not bulge out over the periphery of the flanges and be cut thereby. This advantage is secured by the breadth of the tire between the flanges, the placing of the angle between the exposed and unexposed portion below the periphery of the flanges, and making the exposed portion at an obtuse angle to the unexposed portion.

By locating the two wires entirely within the unexposed portion, advantage is taken of the great width of the tire and the mass of the rubber at that point so as to provide greater strength of rubber on which the wires bear.

By the use of *two* wires well separated from one another and still surrounded by sufficient rubber, the danger of cutting the rubber by the fastenings is reduced to a minimum.

By having two wires the rubber tire is held at two points, thereby distributing the strain and obtaining greater security than if the tire were held at only one point.

By the use of the two wires in combination with the shape of the tire itself, there was for the first time obtained a tire which was durable, because it was mobile and would *yield* laterally to the lateral blows and strains received when the wheel and tire were driven against car tracks, curbings and inequalities in the road. Because of the shape of the outer portion of the tire, in combination with the shape of the inner portion and the shape of the flanges, the tire when

under compression and when struck with a side blow does not simply squash down over the opposite flange and get a bearing thereon, but it bears in the lower corner between the opposite flange and the bottom of the channel and tends to lift the side of the tire on which the blow is struck. Between each wire and the bottom of the channel is an annular cushion of rubber, and this cushion, no matter how tightly the wires have been stretched in the application of the tire, possesses some elasticity. The side blow lifts that side of the tire, and with it the wire on that side, because this annular cushion beneath the wire is composed of rubber and allows the wire to lift. Because, therefore, of its construction, the Grant tire is able to yield sufficiently, although slightly, so as to cushion the side blows, and the life of the tire is thus prolonged. This is a very valuable feature of the Grant tire, and this function alone is new and inherent in the tire, as found as a fact in this case by the Circuit Court of Appeals for the Second Circuit.

It must be borne in mind that the Grant tire is *not* cemented into the channel. This is an essential and important point. Any tire that is cemented in its channel is rigid and cannot "creep" or yield to lateral blows. It is, therefore, easily and quickly destroyed. The absence of cement in the Grant tire is a vital characteristic. As we shall see when we come to examine the prior art, Grant, by omitting the cement and by permitting the tire to tip, to creep and to move in its channel, obtained a radically new and useful result.

The two wires in the Grant tire being tightly drawn prevent the side blows or twists from pulling the tire entirely out of the channel, although permitting the slight tipping just referred to.

The shape of the channel with its flaring flanges and the shape of the tire fitting thereto causes the tire, after having been tipped by a lateral blow, to reseat itself in the channel

in its normal position. A tire which permitted tipping but did not provide by the correlation of the parts for re-seating would be a useless structure.

By the use of the annular wires entirely enclosed within the holes in the rubber tire and not secured in any way to the channel, opportunity is provided for the rubber tire to "creep" around the wheel, and there is no danger of the tire being torn and the wires broken because of this tendency of the tire to "creep".

The re-enforcing strip of canvas at the bottom of the tire and extending partially up on the sides of the unexposed portion adds strength and durability to the tire.

To these features and to their combination in one structural unit, the Grant tire owes its unparalleled supremacy in its field.

THE PRIOR ART.

It is not contended by anyone that there is any patent in the prior art which is an anticipation of the Grant tire. The defendant's experts and counsel and the Court of Appeals for the Sixth Circuit have all recognized and admitted that the combination of elements found in the Grant tire is a new combination; but the proposition has been advanced that the patent is invalid, because each of its elements individually may, in a sense, be found in the prior art.

We respectfully submit that a study of the prior art only serves to emphasize the merit of the Grant patent and to show wherein its elements form a real and novel combination having marked patentable quality, and that it was because of the lack of this combination that the prior devices failed. Grant did far more than merely collect together a channel from one patent, a tire from another patent and a fastening device from a third patent, and put them all together so that each would perform its own function in its old way.

We ask the court to look at the "Prior Art" exhibited in "Complainant's Diagram of Rubber Tires", as it contains, in convenient form, illustrations of all those devices which are supposed to be pertinent as references to the Grant patent.

The following patents may be dismissed without any discussion at all, as they show no one of the three essential features of the Grant patent, namely, the channel with flaring sides; the rubber tire set into that channel and having an exposed portion at an angle to the unexposed portion; and fastening devices composed of one or more wires. (We give herewith the numbers of the prior patents marked on "Complainant's Diagram of Rubber Tires, Prior Art".)

No. 1,	Dale British	patent No.	12,580.
2,	Woodward	"	443,735.
3,	Myers	"	468,971.
10,	Kearsley	"	4,352 of 1883.
11,	De Spare	"	540,478.
16,	Schrader	"	466,577.
24,	Brown & Stillman	"	488,494.

The following patents may be considered together, as they show merely a rubber tire cemented into a channel:

No. 4,	Everett Swiss	patent	No. 8,120.
5,	Kelley	"	321,819.
6,	Owen	"	365,091.
7,	Kelley	"	362,514.
8,	Lenton	"	14,812 of 1890.
9,	Coops	"	20,678.

None of these patents shows any form of fastening except cement for holding the tire in the channel.

The Owen patent (No. 6) having been referred to by the Circuit Court of Appeals for the Sixth Circuit may be taken as the best example of this class. It is a velocipede tire having an outside portion of hard rubber and an inner por-

tion of soft rubber. Its cross-sectional shape resembles superficially the cross section of the Grant tire, but it differs essentially therefrom in having the angle between the exposed portion and the inner portion on a line between the peripheries of the flanges of the tire. There are no wires or fastenings of any kind to hold the tire in its channel, but it is supposed to be held in place, as are the other tires of this class, by cement only. As long as the cement holds, the tire is prevented from creeping and from yielding to side blows, and because of this rigidity the tire would be quickly torn from its cement and thrown out of the channel.

The defendants and the public in general are at liberty to use this Owen tire cemented into its channel, but they have not done so for the simple reason that it is impractical.

The Owen tire is a good example of the efforts of prior patentees to solve the problem of a successful rubber tire by making the tire solid and immovable in its channel.

The Grant tire differs from the Owen tire in having the angle between the internal and external portion of the rubber below the peripheries of the flanges of the channel and in having two wires for holding the tire in its channel, yet allowing it to creep if necessary and to tip and yield to lateral blows, so that the tire is securely and durably, though yieldingly, held in its channel.

The remaining tires of the prior art are provided with some form of wire or band re-enforcements or fastenings, and will, therefore, be discussed one by one.

The defendant's expert in this case lays the most stress on the two British patents to Willoughby, No. 12 and No. 25 on complainant's diagram.

No. 12, Willoughby patent No. 5924 of 1892, contains many figures, but most reliance is placed upon Fig. 8-*a*. This figure shows a channel with *converging* flanges, a rubber tire shaped with downwardly spreading sides to fit within those converging flanges, and two coiled wires inserted

through holes in the rubber tire. This is merely an example of another effort to hold the tire solidly in place in its channel. The converging flanges would have that effect so long as the side blow was not too severe. If it was severe enough to tip the tire, it would lift it from its channel and the tire would never restore itself to its seat because the bottom of the tire is its widest part. Moreover, the wires being merely spring wires, can have but very little effect in holding the tire in place. They would allow the tire too great movement and would be absolutely inefficient. They are obviously used simply to strengthen the tire longitudinally and to limit its longitudinal elasticity. The spring wires stretch and contract as does the rubber, but more positively and definitely. They are not holding devices in any sense.

Why does not the defendant use this tire?

No. 25. Willoughby patent No. 18,030 of 1892, shows a steel tire laid on top of a rubber bed in a channel on the wheel. Two wires are provided, but they pass through holes in the steel tire and not in the rubber bed, and they are above the flanges of the channel.

It is perfectly clear from these two patents that Willoughby never had any other idea than to hold his tire solidly in place in its channel. There can be found no conception, even if the two Willoughby patents be combined, of a tire like Grant's having a channel with outwardly flaring flanges held in place by two springless wires located in the inner or unexposed portion of the tire and at its broadest point, thereby obtaining the greatest possible mass of rubber as a bearing for the wires and permitting the tire to tip and yield so as to cushion the side blows received by it. Certainly this vital part of Grant's combination is entirely lacking in the Willoughby patents.

The Willoughby patents were before Judge Thomas in the original case on the Grant patent in 1898 and were before the Court of Appeals for the Second Circuit in the

Firestone case; but no special attention was paid to them, as in those cases they were not regarded as particularly pertinent references to the Grant patent and the attorneys for the defence in the Firestone case were the same as are for the defence in this case. The Willoughby patents have not changed since they were presented to the consideration of Judge Thomas, and the only real reason why they are now urged by the defendant's experts is that the Court of Appeals for the Second Circuit has so effectually disposed of the Latta patent as a reference as to throw the defence back on to the much less suggestive Willoughby patents.

No. 14, the Latta patent No. 341,811, was relied on most strongly by the defendants in the Firestone case, but the Court of Appeals in that case so effectually disposed of it that very little has been heard of it since. It shows a tire having serpentine spring wires imbedded in the rubber portion. The wires like those of Willoughby patent No. 5924 are merely re-enforcing devices and have little or no effect in holding the tire in place. The Latta patent at page 2, line 85, advocates the use of cement for holding the tire solidly in place. The shape of the base is such that, if the tire were tilted, it could not reseat itself.

Let the defendants use the serpentine spring wires imbedded in the rubber tire of the Latta patent, and let them use cement to fasten the tire in the channel. They would thus avoid the Grant patent. They have not used the Latta tire because it would not work in that it does not contain the combination which has made the Grant tire a success.

The Circuit Court of Appeals for the Second Circuit thus disposes of the Latta patent (Firestone Case, 151 Fed. 237):

> "The patent to Latta, No. 341,811, granted May 11, 1886, is now advanced as the nearest approach to anticipation found in the old art. It is a somewhat significant fact that the Latta patent is not mentioned in the opinion of the court in either the Goodyear or

Columbia case, but, irrespective of any presumption which may be drawn from its belated prominence, we are of the opinion that its disclosures are in no way fatal to the claims in controversy. Our reasons may be epitomized as follows:

"First. The patent is for an improvement in velocipedes, or bicycles, where the wheels, guided by the rider, follow each other in a narrow track. The danger from lateral strain in such a vehicle is comparatively remote.

"Second. The description says that 'It is obvious that the tire may be secured in its seat by cement, in the usual manner, if desired'. If this were done the distinguishing feature of the Grant tire would, in any view, be eliminated.

"Third. The wires are molded into the tire, thus preventing all independent action between the wires and the rubber. If subjected to lateral strain the rubber will not turn on the wires, and if subjected to longitudinal strain it will not 'creep' along them. The Latta tire in this particular is little more than a rubber tire reinforced and strengthened by wires.

"Fourth. The wires are wavy or serpentine in form, 'which prevents them from drawing in the tire if broken therein'. Every precaution seems to have been taken to prevent any independent movement of the wires. It is also obvious that with the use of these sinuous, wavy wires there must be many points where the wires are not within the inner or unexposed portion of the tire, namely, below the line between the two angles of the tire, as pointed out by Grant. When subjected to lateral strain at these points it would seem that the tire can no longer exert the necessary leverage to lift the side of the tire from the channel. In other words, the strain will operate to crowd the tire against the

opposite flange with no tipping action to relieve the pressure.

"Fifth. Latta's tire is circular in cross-section, there being no angles as shown at c' of the Grant drawings. The widest part of the Latta tire is above the outer peripheries of the flanges and receives no protection therefrom.

"Sixth. The bottom of Latta's tire is concaved to fit a corresponding convexity in the bottom of the channel, and it is argued with some plausibility that such construction would, in case of lateral strain, severe enough to cause either side to rise, result in jamming the rubber so that it could not readily reseat itself.

"Other reasons might be given, but we think enough has been said to show that in our judgment Latta had no conception of the improvements found in the Grant structure."

No. 15, the Welch British patent No. 14,563 of 1890, and No. 21, the Timberlake British patent No. 20,706 of 1890, show specifically the same construction. The flanges of the channel are practically done away with and shallow grooves provided into which the rubber tire sets. The tires are re-enforced by wires through the portions setting into the grooves. In the Welch patent, page 5, line 39, the use of cement is advocated for securing the tire to the channel. Cement certainly would be necessary, because the wires are so arranged as to have almost no efficiency in holding the tire on the rim. The least side blow would knock the tire off the rim. These patents are entirely foreign to Grant's invention.

No. 17 and No. 18, the Elliott patents 440,701 and 440,702, show rubber tires set into a channel having substantially vertical sides. In patent No. 440,701 attempt is made to hold the tire in the channel by pins or rivets passing through the rubber and the rim. In patent No. 440,702

a circular band passes through a hole in the tire, and its ends are fastened by carrying them through the tire and through the rim of the wheel.

The Elliott patents show simply another effort on the part of the prior inventors to hold the tire rigidly in the channel. In both of the patents the flanges of the channel are straight, and the fastening devices are intended to be solid and unyielding, and therefore there could be no tipping or yielding of the tire as in the Grant structure to soften the blows received in actual use.

No. 19, Grant and Jeffrey's patent No. 470,483; No. 20, Green patent No. 169,100; No. 22, Fig. 6 of Rogers patent No. 539,826, and No. 26, original Rogers tire, all having a single wire or a group of wires through a hole in the middle of the tire, are entirely different from the Grant patent. Owing to the shape of the channel in every one of these devices, it would be impossible for the tire to tip or yield on account of a side blow. The fastening being central also holds the tire against any such yielding action. These patents lack all the characteristics of the Grant tire. The flanges of the channel are not flaring. There is no angle between the inner or unexposed portion of the tire and the outer or exposed portion of the tire lying within the periphery of the flanges, and there are not two wires firmly but yieldingly holding the tire in place in its channel. The shape of the tire and the shape of the channel are not such that the tire could reseat itself automatically if it had once been tipped out of place.

No. 22, Figs. 7 and 8 of the Rogers patent No. 539,826, shows tires with vertical sides intended to be cemented in a channel having vertical flanges. (See page 1, line 75 of the Rogers patent.) In Fig. 7 two wires are shown, and in Fig. 8 a band is shown, both forms of fastening being located above the flanges and at points in the tire where it is narrowest and therefore weakest. These Rogers fasten-

ings are detrimental rather than helpful to the Rogers form of tire, because they weaken it at critical points, and because they serve, on account of the square shape of the tire and channel, to hold it solidly in place in the channel. The Rogers patent lacks all the features which make the Grant combination a success. Why does not the defendant use the Rogers tire rather than submit to the expense of defending this suit?

No. 23, the Claypool patent No. 432,223, has a channel with inwardly converging flanges in Fig. 5 and with perpendicular flanges in Fig. 8. In Fig. 5 two wires are imbedded in one slit in the channel. This patent is not pretended to, and does not, contain any feature of Grant's invention and is absolutely immaterial.

This review of the prior art makes it perfectly clear that the entire effort of all those who preceded Grant was to obtain a tire which would be solid and unyielding in its channel. The prior patentees endeavored to secure this result by every means possible. In almost all cases they advocated the use of cement. In some cases they sunk their tire deep into the channel and made the sides of the tire and sides of the channel perpendicular so as to obtain perfect solidity. In other cases with the same object in view, as, for instance, in the Willoughby patent No. 5924, the flanges of the channel were made to converge inwardly in order to clinch upon the tire.

In not one of these patents is there described a structure which could by any possibility have the mode of operation and the consequent success of the Grant tire.

As we have seen, each one of these patents lacks some of the essential features of the Grant patent. Each one was a failure and the Grant tire has been a wonderful success.

Is not that fact sufficient to show that the differences that exist between the successful Grant tire and the useless tires of the prior art are material and vital differences?

Inasmuch as it is fully proved in the record before this court that the date of Grant's invention is early in the spring of 1894, it is unnecessary to consider the Blosser and Kunkle patent No. 529,474. Prior to the date of Blosser and Kunkle's application, July 23, 1894, Grant had made a full-sized rubber tire like that shown and described in the patent in suit and had it in use in the spring of 1894. The B. F. Goodrich Company, of Akron, Ohio, furnished the rubber in April, 1894. (See the B. F. Works' deposition, page 4 of the "Extract from Defendant's Exhibit Appeal Record Goodyear Case":* original letter reproduced, and the original drawing of the Grant tire furnished the Rubber Company, opposite page 2.) Both E. S. Kelley and A. W. Grant confirm Works' testimony. (See same page 12, Qs. 14–16, and page 26, Qs. 3–5.) Grant further testified that he disclosed his invention to Blosser and Kunkle early in 1894. (See same Q. 5, page 26.) This matter need be considered no further, as defendant, we understand, does not contend that Blosser and Kunkle's invention antedates Grant's invention.

We doubt if any case has ever come before the court disclosing more persistent efforts for many, many years, prior to the patent, to solve the problem first solved by the patent. These efforts were not confined to this country. All over the civilized world the desirability of a suitable tire for vehicles was recognized and every effort made to secure it. The need in this country was so clearly recognized that, as the record shows, American manufacturers sent representatives to foreign countries, prior to 1894, to investigate as to rubber tires. All these efforts were practically fruitless as far as any useful result was concerned, until Grant made his invention. We have in this record that one of the prominent carriage manufacturers in the West, Charles F. Kimball, of

* This contains certain portions of the record in the Goodyear case which are not printed in the main record in the present case, but are evidence herein, under the stipulation (Rec. p. 99).

Chicago (Rec. 545), went abroad and brought back all the information he could get — what did that amount to? Absolutely nothing. One of the prior patentees, Howard DuBois, of Philadelphia, and also representative of several other large concerns, went abroad for the same search and nothing but failure resulted. Forms of fastening means such as the Elliott and DuBois tapes or bands had been suggested, and they represented the best fastening appliances so far as strong, rigid fastening appliances were concerned, but Grant's combination employed an entirely different form of fastening in its association with the other elements of the combination — one far less strong in and of itself but capable of co-operation with the other elements. In that lay its strength.

The development of the business, due to the popularity of the Grant tire, was marvellous. Originally introduced at Springfield, Ohio, in 1894, by Kelly and Grant, its supremacy grew until in November, 1905, in the cities of Chicago and New York, no other form was being sold for heavy carriages. (Rec. 247, Rec. 851–853.) By 1908 one branch manager alone had applied 50,000 Grant tires. (Rec. 57.)

GRANT'S TIRE IS NOT AN AGGREGATION.

The defendant attacks the validity of the Grant patent on the lines of the decision of the Circuit Court of Appeals for the Sixth Circuit in the Goodyear case, 116 Fed. 363, alleging, first, that the Grant tire is not a true combination but is an aggregation of old devices; and, second, that if it is a combination it does not show invention over the prior art.

We will consider these arguments in their order. The opinion of the court in the Goodyear case cites against the Grant patent the cases in this court of — .

Hailes v. *Van Wormer*, 20 Wall. 353;

Reckendorfer v. *Faber*, 92 U. S. 347;
Pickering v. *McCullough*, 104 U. S. 310.

These three Supreme Court cases establish clearly the difference between a combination and an aggregation, namely, that an aggregation merely brings together in juxtaposition old devices, neither reacting on the other with a new result or new mode of operation, but each retaining its old mode of operation and each producing its old effect; whereas a combination of old devices is the association together of those devices in a united whole, wherein each device co-operates with the others to produce a unitary new and useful result.

In *Hailes* v. *Van Wormer*, the patentee had brought together into one stove various different devices, such as a fire pot, a coal reservoir, invertible flues, dampers and openings in the casing, each of which was old, and in the patented stove was placed merely in juxtaposition to the other elements, and did not co-act therewith. The patent, therefore, was held invalid as an aggregation.

In *Reckendorfer* v. *Faber*, a patent for a lead pencil having a rubber tip was held invalid as merely aggregating on one holder the lead for writing and the rubber for erasing. This case gives several illustrations of the difference between an aggregation and a combination, laying down the law as follows (p. 357):

> "The combination, to be patentable, must produce a different force or effect, or result in the combined forces or processes, from that given by their separate parts. There must be a new result produced by their union: if not so, it is only an aggregation of separate elements. An instance and an illustration are found in the discovery, that, by the use of sulphur mixed with india-rubber, the rubber could be vulcanized, and that without this agent the rubber could not be vul-

canized. The combination of the two produced a result or an article entirely different from that before in use. Another illustration may be found in the frame in a saw-mill which advances the log regularly to meet the saw, and the saw which saws the log; the two co-operate and are simultaneous in their joint action of sawing through the whole log: or in in the sewing-machine, where one part advances the cloth, and another part forms the stitches, the action being simultaneous in carrying on a continuous sewing. A stem-winding watch-key is another instance. The office of the stem is to hold the watch, or hang the chain to the watch: the office of the key is to wind it. When the stem is made the key, the joint duty of holding the chain and winding the watch is performed by the same instrument. A double effect is produced or a double duty performed by the combined result. In these and numerous like cases the parts co-operate in producing the final effect, sometimes simultaneously, sometimes successively. The result comes from the combined effect of the several parts, not simply from the separate action of each, and is, therefore, patentable."

In *Pickering* v. *McCullough* this Court held that it required no invention to use a mold for shaping the exterior of a crucible, the inside of which was shaped by a well-known device, when it was old to use such a mold to shape the exterior of the crucible when its interior was being shaped by hand.

It is very plain from these decisions that the Grant tire is not an aggregation. Each part co-acts with the other part to produce a united whole having a combined effect. The channel with its flaring flanges supports and partially embraces the rubber tire. It is so shaped that the tire cannot be cut against the edges of the flange. The two wires

co-act with the rubber tire, bearing against the rubber at its thickest portion and below the peripheries of the channel. The two wires press and hold the rubber tire in the seat formed by the channel and its flanges, and each acts independently of the other to form a separate fastening; yet each wire co-acts with the other wire to enable the tire to yield to the side blows received in actual use, one wire rising as the tire is tipped and the other tire forming, as it were, the fulcrum for this tipping action. The shape of the tire is such that this tipping action is permitted and such that, when the side force is removed, the tire may reseat itself in its original position. The two wires being continuous permit the tire to move and creep relatively to the wires so that no strain is brought upon the wires from the natural tendency of the tire to creep. There is, in fact, most perfect co-action between the elements of the Grant tire.

A good illustration of a similar combination is found in the ordinary electric incandescent lamp, where the base, the glass bulb, and the incandescent filament form a true combination, each part acting upon the other in the same way as do the parts of the Grant tire act upon one another.

The defence that the Grant tire is an aggregation of old devices must absolutely fail.

THE GRANT TIRE IS A PATENTABLE COMBINATION.

There can, therefore, be no doubt that the Grant tire is a combination and it is clearly also a patentable combination. Even if it be assumed that the individual elements of the Grant tire can be found in the prior art in separate patents, there is no patent in which these elements are combined in the single unitary tire. This fact is undisputed.

The mechanic skilled in the art and having knowledge of these prior devices would have sought in vain for the idea of the combination which produced for the first time a suc-

cessful rubber tire. There was no foreshadowing or hint of that idea in the prior art. It required the genius of the inventor to develop it. Even if the prior art had taught the skilled mechanic to use some of the elements of the Grant tire separately, it did not teach him to combine them as Grant combined them; but, on the contrary, although the prior art taught the skilled mechanic many kinds of combinations, they were all different combinations from that of Grant. The very multiplicity of the tires of the prior art, all practical failures, emphasizes that more than mere mechanical skill was required to so combine and organize the elements of the tire as to make it what the world had been trying to get for many years.

Our discussion of the prior art (*supra*, pp. 26–36) has shown that rubber tires were old, that channels for holding them were old, and that fastening devices of various kinds — some of them consisting of one or more wires or tapes — were old, but the art entirely fails to show, as every one admits, the combination of channel, tire and wires first made by Grant.

The Court of Appeals for the Sixth Circuit admitted this.

> "It may be conceded that no rubber tired wheel in the old art has been shown which includes each of the identical parts which unite to make Grant's tire."

(Goodyear case, 116 Fed. 369).

The prior art taught that it was essential to hold the rubber in the channel rigidly and immovably, and for this purpose substantially all of the prior patents advocate and direct the use of cement for holding the rubber tire in place. This is true among others of the Owen patent and the Latta patent, which have been strongly relied on as most nearly approaching Grant's invention. The use of cement proves absolutely that these early inventors had no thought whatever of Grant's tire. They had no conception of

Grant's underlying theory or of his method of operation. They were all struggling to hold the tire so solidly to the rim that it could not budge. This effort, as we have seen, necessarily resulted in failure, because such tires do not cushion the side blows and, therefore, quickly break from their fastenings, no matter how solidly made, and are torn from the rim.

Many of the patents of the former art resort to *inwardly* converging flanges on the channel in order to hold the tire in place. A good example of this is the Willoughby patent No. 5924, regarded in this case by the defendant's expert as being the closest reference to the Grant patent, although in previous litigations this patent has not been considered sufficiently pertinent to be called specifically to the attention of the courts. This again is an effort in the wrong direction.

In the Willoughby patent No. 18,030 the external face of the tire is made of steel and through it run two fastening wires. This steel rim would not yield, but is intended to hold the rubber solidly in place in the channel. The patent is not for a rubber tire at all, but for a steel tire with a rubber seat. It is absolutely immaterial.

In those prior patents which do show wires, the two considered most pertinent by the defendant showed merely spring wires. In the Willoughby patent No. 5924 the wires are made with spring sections and in the Latta patent the wires are molded in serpentine form into the rubber tire. The wires are not relied upon to hold the tire in place, but merely to reinforce the rubber. In the Willoughby patent the flanges are sloped inwardly, in order to clinch the tire, and in the Latta patent cement is used.

In the Welsh British patent and in the Timberlake British patent there are no substantial flanges to hold the tire in place, and reliance must be laid on cement. There is no

combination in these patents between channel, tire and wires, as is found in the Grant tire.

In fact, the teaching of the prior art was entirely away from the combination found in the Grant patent. Grant made an obtuse angle between the inner portion of his tire that fits the channel and the outer or exposed portion, and placed that angle below the peripheries of the flanges of the channel. By reason of the construction there is no danger of cutting the tire on the edges of the channel. No such arrangement is found in the prior art. In the Owen patent, which is perhaps the closest to this construction, the angle between the inner and outer portions of the tire is at the periphery of the flanges. In other patents effort is made to prevent the cutting of the tire on the flanges by rounding the flanges, as in the Elliott patents, Nos. 17 and 18. None of the prior patents teach the art that it is necessary that the angle between the inner and outer portions should be *below* the periphery of the flanges.

Those patents of the prior art showing more than one wire place these wires in the tire at an entirely different place from the place where Grant places his wires. In Grant's tire the wires are located below the peripheries of the flanges and in the thickest portion of the tire, so as to provide a substantial amount of rubber as a bearing for the wires. In the Willoughby patent No. 5924 the spring wires are placed close to the edges of the tire. In the Latta patent three wires are used, thereby cutting the tire too much, and the outside wires are placed close to the edges of the rubber tire. In the Rogers patent, No. 22, the fastenings, consisting of one wire, of two wires, or of a band, are placed at the narrowest point of the tire so as to weaken it where it should be strongest. Thus the prior art, even in this matter of the location of the wires, fails to suggest Grant's construction.

Thus we submit that the prior art, down to almost the

smallest detail, taught the skilled tire-maker absolutely nothing as to the organization and relations on which the Grant tire has built its success and practically nothing as to any of Grant's individual features. Any accidental resemblance between a detail of the prior art and the corresponding detail in the Grant patent is not in the slightest degree significant, for that particular detail in Grant gets its value only from its relation to other parts and its functions as an element in Grant's new organization. The prior art said: "Make your tire solid in its channel either by cement or by clinching the flanges of the tire. Do not allow the tire to have the least movement. That would be fatal". The prior art said: "If you use wires, place them anywhere, generally above the flanges of the tire, and make these wires springlike or serpentine. Do not allow the tire to 'creep'". All these teachings would have led a man skilled in the art directly away from the Grant tire.

It is admitted that the Grant tire is different in structure and in the arrangement of its elements from the tires of the prior art; but it is argued that these differences are immaterial, yet it is also conceded that the Grant tire is a practical success, while all the devices of the prior art were failures. The only logical conclusion that can be drawn is that the differences between the Grant tire and the tires of the prior art are not immaterial, but are just those differences which caused it to become a commercial success.

Where an inventor has struck out on lines that are, as in this case, new, and has succeeded where others have failed, invention, we submit, must necessarily be present. Grant did not merely select one feature from one patent and another feature from another patent, but with great intelligence and inventive skill he combined various elements, some of them found in the prior art, into a new and useful structure having a new and useful combination and mode of operation. Even if all the elements are individually old,

such a combination has often been recognized as of the greatest importance in the development of the useful arts and well worthy of protection by Letters Patent.

The law was expressed by this Court in *Loom Company* v. *Higgins*, 105 U. S. 580, in which case the Court held valid a patent for a loom, the elements of which were all old, against the argument that it required no invention to produce the combination. The Court said (p. 591):

> "At this point we are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention. It was certainly a new and useful result to to make a loom produce fifty yards a day when it never before had produced more than forty; and we think that the combination of elements by which this was effected, even if those elements were separately known before, was invention sufficient to form the basis of a patent."

See also:

Potts v. *Creager*, 155 U. S. 597, 608.

Carnegie Steel Co. v. *Cambria Iron Co.*, 185 U. S. 403, 446.

Krementz v. *Cottle Co.*, 148 U. S. 556, 559.

In Cantrell v. *Wallick*, 117 U. S. 689, the Court said (p. 694):

> "The first defense is based on the theory that a patent cannot be valid unless it is new in all its elements, as well as in the combination, if it is for a combination. But this theory cannot be maintained. If it were sound, no patent for an improvement on a known contrivance, or process, could be valid. And yet the great majority of patents are for improvements in old and well-known devices, or on patented inventions. Changes in construction of an old machine, which increase its usefulness, are patentable. *Seymour* v. *Osborne*, 11 Wall. 516. So a new combination of known devices, whereby the effectiveness of a machine is increased, may be the subject of a patent."

In *Expanded Metal Co.* v. *Bradford*, 214 U. S. 366, the Court said (p. 381):

> "It is perfectly well settled that a new combination of elements, old in themselves, but which produce a new and useful result, entitles the inventor to the protection of a patent."

We respectfully submit that in this case it was certainly a new and useful result to make a successful solid rubber tire to complete the elimination of all other such tires from the market.

QUALITIES INHERENT IN THE GRANT TIRE.

In accordance with these authorities, the Grant patent has been sustained many times by the Circuit Courts and by the Courts of Appeal, which have held that the Grant tire possesses patentable novelty involving a new organization and a new mode of operation which was inherent in that organization. The Court of Appeals for the Sixth Circuit, in the Goodyear case, 116 Fed. 363, did not have before it the true facts when it held that the Grant patent was

invalid. This Court proceeded on the theory, new at the time of the hearing before it, that the important feature of the Grant patent, consisting in the capacity of the tire to move and tip in its channel, was not inherent in the structure of the tire. The Court was led to believe that this capacity depended on the kind of wires used and the looseness with which they were applied. The Court then drew the inference that if the fastening wires of the Grant patent were sufficiently high in carbon as not to stretch and were applied as tightly as possible, the Grant tire could not move or tip or creep in its channel, but would be held there solidly and rigidly as if it were cemented there like many of the tires in the prior art.

The Court pointed out that there was no evidence in the record before it showing that the Grant tire, if secured with hard wires applied as tightly as possible, had this capacity, saying (p. 374):

> "That this capacity for side tipping or lateral movement under violent lateral strain is an operative function inherent in the particular arrangement of the old parts constituting Grant's combination is dependent wholly upon expert opinion. Its actual presence from practical experience or observation is not shown."

The Circuit Court of Appeals for the Sixth Circuit thus rested its decision that the Grant patent was invalid for lack of invention fundamentally on the finding that on the evidence in that case it was not shown that the Grant tire had the capacity to tip, if wires were used sufficiently high in carbon as not to stretch, and if these wires were applied as tightly as possible to the limit of their breaking strength.*

We wish to call particular attention to the above quoted statement of the Court of Appeals in the Goodyear case, as

*We discuss the opinion of this Court fully *infra* p. 64.

it is a complete refutation of the defendant's argument that in that case the capacity of the Grant tire to tip and move in its channel was fully proved.

The record in this case entirely disposes of this contention. The Court of Appeals for the Second Circuit expressly found as a fact that on this record the Grant tire was inherently capable of tipping in its channel, although the high carbon wires were applied stretched nearly to their breaking point, and that court said that, if this fact had been proved in the Goodyear case before the Court of Appeals for the Sixth Circuit, a different decision would undoubtedly have been reached. (Firestone Case, 151 Fed. 239.)

The tire of the Diamond Rubber Company, the defendant in this case, is made with high carbon wires applied with as much tension as the wires will stand without breaking, and the defendant's expert Pond has contended that it "staggers his mechanical credulity" to suppose that the tire can tip without breaking the wires. In other words, the defendant would like to contend that its rubber tire is held solidly in place in the channel.

This contention is on its face meretricious. If the defendant had desired to hold its rubber tire solidly in its channel so that it could not tip, it could easily have accomplished this result by cementing the tire in the channel or by clinching the flanges. The fact that the defendant does not use cement or clinching flanges, but does use Grant's combination, in which the tire is entirely free to tip and move, shows that the defendant insists upon retaining the combination of the Grant construction, although its argument would deny its advantages.

Let the defendant use a cemented tire or a clincher tire and avoid the beneficial tipping and moving of the Grant tire, and avoid infringement and the expense of litigation.

The fact that the Grant tire has the capacity for tipping

and thereby cushioning the lateral blows received as the tire strikes car tracks, curbings and other inequalities in the road, is proved in three different ways, by any one of which alone the fact would be sufficiently established.

I.

The capacity for the tire of Grant's invention to tip was shown by the simple expedient of inserting a screw-driver underneath one side of the "Defendant's Exhibit a Standard Rubber Tire Wheel", an example of the Diamond infringing tire sold by the defendant, and prying it up. (Rec. p. 330.) This was done in the presence of defendant's expert (Rec. p. 472), whose mechanical credulity must, then and there, have been satisfied that the tire had the capacity to tip, if the force was applied so as to accomplish the result. As abundantly proved, this tipping capacity of the tire of the Grant patent is due to the fact that there is a cushion of rubber lying between the wires and the bottom of the channel, and, as the side of the tire rises, the wire presses into this rubber cushion around the entire circumference of the tire and thereby rises slightly at the point where the force is applied.

Defendant's patent expert Pond admitted (Rec. p. 469):

> "I have tested the exhibit wheel (the Diamond tire) referred to in the question by forcing the blade of a heavy screw-driver under the tire centrally of the cut-away portion of the flange and prying the tire up with it, and *I have found that the tire and the adjacent exposed portion of the wire can be raised by such an operation to a slight extent.*"

Defendant's practical tire expert, Charles H. Smith, testifying concerning defendant's Diamond tire, admitted (Rec. p. 341):

> Ans. to R-X. Q. 122. "*It shows slight ability to yield to the use of a screw-driver.*

"R-X. Q. 123. The application of the screw driver to 'Defendant's Exhibit a Standard Rubber Tired Wheel', in the same way, shows that the elasticity of the rubber under the wire and its ability to yield is even greater than on the Firestone Side Wire Tire, because of the greater thickness of rubber due to the absence of cross wires. Is that not true?

A. Possibly so."

Defendant's witness Gorman testified about this Standard Diamond tire (Rec. p. 390):

"X-Q. 26. Now I am going to insert this screw-driver under the tire and the wire and raise both from the wheel and I ask you whether you do not see that both the rubber and the wire are raised up under the action of the screwdriver?

A. Yes, I saw it.

X-Q. 27. Then these tires are not put on so tightly that it is impossible for the wire and rubber to yield, provided the right kind of strain is put on it; is that true?

A. *Yes, there is naturally some elasticity in rubber.*"

Defendant's witness Samuels stated (Rec. p. 434):

"X-Q. 54. Here is a tire which a Diamond rubber man testified was put on as tight as he could, and yet by simply putting a screw-driver under it, as I do here, and moving it you can raise the base of the rubber, and also move the wire; did you know that?

A. Yes, sir, I know that.

X-Q. 55. What permits this wire to move?

A. Where it sinks to the rubber as he puts the screw-driver under it.

X-Q. 56. That is, it's the elasticity of the rubber between the wire and the channel, is it not?

A. Yes, sir.

X-Q. 57. *So that it is not impossible for this wire or rubber to yield or raise away from channel, provided the proper force is applied to it in the proper manner; is that right?*

A. *Yes.*"

Defendant's witness Ludlam testified generally as to the Grant type of tire (Rec. p. 257):

"X-Q. 91. Then if force enough were applied at any point to raise the retaining wire, this underlying rubber would yield to some extent, would it not?

A. It will."

"X-Q. 108. In other words, the underlying mass of rubber is not of sufficient hardness so but that this wire will or may yield and raise somewhat if sufficient force is applied; is that correct?

A. Yes, it will raise a little."

Defendant's witness Meckel testified (Rec. p. 366):

"X-Q. 47. When I put the screw-driver under this exhibit referred to (the Standard Diamond Tire) and raise it, can you see the wire move?

A. I did.

X-Q. 48. Do you know what permitted that wire to move when it was forced up?

A. I think so.

X-Q. 49. What was it, do you think?

A. Why, the elasticity of the rubber. The drawing of the wire against the rubber with a pry from underneath would allow the wire to move at the point of the pry, I should say.

X-Q. 50. *In other words, it's the elasticity of the rubber which lies between the wire and the channel against which the wire is drawn at one side of the wheel when the wire is drawn away at the other side; is that right?*

A. *Yes.*"

In the face of this testimony of its own witnesses the defendant was obliged to admit that the tire of the Grant patent, both generally and in the specific form of the Standard Diamond tire sold by the defendant, could tip.

It was then said that the forces applied in practice are applied differently from the application of the force by the screw-driver and could not possibly tip the tire. The screw-driver tests showed, however, that the tire tipped without breaking the wires. Defendant's own practical witnesses testify that the side strains found in actual use are often sufficient to break the wires. Broderick, a carriage builder of fifteen years' experience, called by defendant, admitted (Rec. p. 235):

> "Of course, there is times when the wires will break."

Ludlam, who has a large general carriage and wagon shop in Glencove, Long Island, and does a business of $50,000 a year, makes the same admission. (Rec. p. 258.)

Defendant's witness Hudson, a tire salesman who has been familiar with the Grant type of tire since 1896, states that the side strains are sufficiently violent to break the solid band of the International tire. (Rec. p. 286, X-Q. 44, X-Q. 45.)

Defendant's witness Koenig, who did nothing but apply tires for two years before he testified and was familiar with the Grant type of tire for two and one-half years, says (Rec. p. 297) that he has known of cases of the breaking of the wires when the tire was caught in a switch or frog.

There, therefore, can be no question but that in actual use the side blows are frequently sufficient to break the wire. The strain put on the wire by the screw-driver is enough to lift it but not to break the wire. It, therefore, follows as a matter of inevitable conclusion that the side strains and blows are sufficient to tip the tire.

Remember, also, that when the tire of the Grant patent is tipped, it can, by reason of the shape of the tire, the location of the wires and the shape of the channel, restore itself automatically to its original position.

II.

Complainant's tests of tires of the Grant construction in actual use fully demonstrate that the tires yield and the tip under the influence of side strains.

Both Joseph P. Livermore (Rec. p. 760), complainant's expert, and A. S. Krotz, a skilled mechanic (Rec. p. 785), testify fully as to these tests.

We invite the Court to read the deposition of Mr. Krotz, beginning Record, page 781.

Mr. Krotz thoroughly tested the tipping action of a Grant tire by actually connecting the wires in the tire to a pointer which made a mark on a piece of painted glass secured to the rim of the wheel. Mr. Krotz fastened the pointers to the wires in three different ways.

The first way is shown in Figs. 1 and 2 of sketch No. 1 opposite page 782, in which the needle which marks the glass is fastened to a wire imbedded in the rubber tire and in contact with the bottom of the wires so as to be moved as the wires move. The second method was to attach the needle by a wire to one of the wires, as shown in Fig. 3 and Fig. 4. The third method shown in sketch No. 2, opposite page 784, was to attach the needle by suitable arms to a rod passing through the tire just above the wires and secured to the wires.

The wires in the tires, used in these tests, were hard wires stretched to their limit; in fact, several wires were broken in putting the tires on the rims, so strong was the pressure used.

The tires used were both of the complainant's construction and of the Firestone construction.

The vehicle, the wheel of which was equipped with these

tires and testing devices, is shown in the photograph opposite page 785, and the road over which it was driven is shown in the photograph opposite the same page.

The results of the tests are shown by the scratches on the plates, photographs of which are shown opposite pages 783, 784 and 785.

The plates show vertical scratches in the cases where the first two kinds of fastenings were used and horizontal curved scratches in the cases where the third kind of fastening was used, such scratches corresponding in all cases to the up and down movement of the wire with respect to the channel of the tire. These tests, therefore, show fully that in actual use the Grant tire is tipped and does yield laterally in the channel when it receives lateral blows and strains.

Mr. Cooper, whose business is to attach rubber tires (Rec. p. 786), testifies that he knows that the Grant tire tips, and corroborates the testimony given by Mr. Krotz as to the tests.

The fact that the Grant tire reseats itself after having been tipped is also fully established by these tests. The defendant argues that these tests should be disregarded, as they were not made in the presence of defendant's counsel, but the complainant offered to repeat the test at any time and place convenient to defendant's counsel, in order that he might verify the accuracy of the witnesses' statements. Defendant's counsel declined on the record to accept complainant's offer. (See Firestone Rec. p. 789.) The defendant has made no effort to contradict the facts proved in these tests. They, therefore, stand unchallenged on this record.

On the contrary, the defendant's expert Pond admits (Rec. p. 213):

> "The tests plainly showed a movement of the wire inwardly or toward the base of the channel, relatively to its normal position, as well as outwardly or from the base of the channel relatively to its normal position."

That the wires and tire so move up and down thus appears to be conceded by the defendant's expert, but he argues that this movement is not due to side strains but to the natural flexion of the rubber tire as it rolls along the ground, compressing the rubber so as to bring the wires nearer to the bottom of the channel opposite the point of contact with the ground and bulging out the rubber ahead of that point so as to raise the wire from the channel. (Pond, Rec. p. 217.)

If the wires do have this up and down or "wave like" movement when the wheel is rolling over a smooth road, it does not disprove that the tire does tip when it is struck a side blow or is twisted in a car track. On the contrary, if defendant's expert Pond is correct, the wires are very easily moved toward and from the bottom of the channel, and the rubber between the wires and the channel is very easily compressed and expanded.

Defendant's whole argument against the tipping of the Grant tire is based on the assertion that the rubber between the wires and the bottom of the channel cannot be further compressed if the hard wires are stretched tightly enough. Pond's explanation of the movement of the wires completely refutes this assertion, because if this rubber can be compressed by the wheel when traveling over a smooth road, it surely can equally be compressed so as to allow one side of the tire to be raised by a side blow or strain.

Moreover, we will admit that the movement of the wires and the flexion of the rubber, lifting it at times from the bed of the channel, may be possible. If it does exist, it is a decided merit in the Grant tire, which is so constructed as to permit this movement and to yield to the force causing it. A tire held solidly and rigidly in the channel, as were all the tires of the prior art, would resist this movement explained by defendant's expert, Pond, and would soon be torn and broken by this very resistance.

The Grant tires having the capacity for movement, as Pond asserts, would not be torn or broken by the forces causing this movement, but by yielding would withstand these forces and not be injured. The Grant tire is like the reed in Æsop's fable, which bending before the storm escapes injury and after the storm has passed springs back into place, while the sturdy oak standing rigidly is broken by the wind. For this same reason the Grant tire withstands the usage, shocks, blows, twists and strains which have proved fatal to all tires not built on Grant's principle.

III.

As further proof of the ability of the Grant tire to move and tip in its channel and cushion the lateral blows, the complainant tested two tires, one having ordinary commercial wires and the other having a specially hard wire, both strained to the limit in their application. The details of the application of the tires to the wheels, of the tightening of the wires and of the tests, are described fully in the deposition of Ernenwein (Rec. p. 49) and of Roberts (Rec. p. 56.)

Ernenwein testified:

> "Why, we put them into a vise, and get on a bench, the wheel setting in the vise, without being clamped, just loosely set in to show the tire set in a slot; a man got on the bench and twisted the wheel about the same as it would — something the same as it would get in use. After that we screwed the rubber tightly into the vise, letting the wheel lie over toward the back of the bench, possibly the top leaned over two feet from a perpendicular point. It showed the base of the rubber raised up to the top of the flange which the rubber was applied in."
>
> "Q. 24. In these two tests which you have described what part of the wheel was in the jaw of the vise?

A. The rubber tire was between the jaws.

Q. 25. Was the tire clamped tight in both tests?

A. No, sir. The first test the rubber was dropped in the vise freely so it rested on the edge of the flange on the jaws of the vise.

Q. 26. What extent, if at all, did the twisting and tipping of the wheels when the rubber was in the jaws of the vise, lift the wires out from the wheel rim?

A. Of course, we didn't measure, but to the best of my knowledge at that point it raised the wire a quarter of an inch.

Q. 27. How near did it lift the wire to the level of the rims of the channel on the wheel?

A. It lifted the wire so you could stick a penknife under the lower side of the wire on top of the flange of the channel.

Q. 28. When the strain on the tires was released by lifting them from the vise what happened to the rubber tires? Did they stay in their displaced position?

A. They did not.

Q. 29. What did they do?

A. With the exceptions of a slight chafing on the tire you would not know that . . . had been in the vise."

"Q. 32. I wish you would state whether the strains to which you put the tires in these tests were any greater or more severe than those to which tires are subject in use on the cabs, and under what circumstances would the tires receive such strains in use?

A. In this case in testing I wrenched the wheel out of the vise myself without disfiguring the rubber in any way with the exceptions of a little chafing. We have had wheels that have had rubber tires applied, come into our shop with pieces torn out of the rubber, which the drivers would claim were caught in car tracks. Other cases the tire has been completely torn

from the wheel. My judgment is that that is a harder test on the rubber than we made on these present wheels."

"Q. 52. Who witnessed these experiments that you have testified about?

A. Mr. Roberts, Mr. Philip Adams, *defendant's attorney*, Mr. Burjison, Mr. Bakewell and Mr. Stapleton."

Roberts testified:

"Q. 27. After these tires were applied to what tests were they subjected?

A. The rubber on the wheel was placed in a vise and the vise clamped up so as to grip the rubber and the wheel tipped away from the perpendicular so as to draw the rubber away from the channel, and it did so.

Q. 28. Was this done with each of these exhibits?

A. Yes.

Q. 29. State whether or not they were also put loosely in the jaws of the vise, and whether the wheel was then twisted to see what the effect would be?

A. The rubber was put in the vise loosely and the wheel twisted so that the rubber was drawn away from the base of the channel.

Q. 30. Please state what effect this pulling away or pulling on the rubber had upon the wires?

A. It displaced the wires from the position in which they were in before the test was made, by disturbing the rubber.

Q. 31. State as to whether or not the strain operated to lift the wires from their normal position?

A. Yes, it lifted the wires away from the position they were originally in when the tire was applied.

Q. 32. To what extent?

A. From one-eighth to a quarter of an inch."

"Q. 26. In your judgment, how did this strain to

which the rubber tire was subjected compare with the strains that a similar tire would receive in actual use in twisting out of car tracks, in butting up against low curb stones, or in being twisted around on a pivot when loaded or other strains that a tire receives in use?

A. The strain brought upon the rubber in the tests was, in my judgment, not so great as many tires receive in actual use. As evidence of this, tires are sometimes returned to us for repairs which have been torn and from which a piece has been torn out, and the rubber usually will show evidence of what has happened to it to cause the injury or mutilation."

The tipping of the tire in its channel, one side rising so much from the seat that the inner portion was exposed, is well shown in the photographs opposite page 75 of the record.

Every possible means, therefore, has been used to prove that the Grant tire is capable of tipping and moving in its channel and thus offering a yielding resistance to lateral blows and strains. This feature in itself is an entirely new mode of operation in a vehicle tire.

DEFENDANT'S CONTENTIONS AS TO TIPPING.

The defendant has introduced the testimony of a large number of livery men and hack men to the effect that they never saw a Grant tire tip in its channel. This evidence is absolutely immaterial. It is absolutely impossible to see the tipping of the Grant tire as the wheel is moving rapidly as the tire strikes the obstruction and is tipped thereby. None of these witnesses ever made any tests of any sort to see whether the tire would tip or not. This evidence proves nothing but that these witnesses did not see the Grant tire tip and did not know why the tire was such a good tire, but

they all, without exception, admitted that they are using the Grant tire extensively in their business to the exclusion of all other tires on cabs, light livery wagons, carriages and such classes of vehicles.

These hackmen know that the Grant tire is the best, but there is no reason that they should know why it is the best.

The defendant produced only one witness, Charles H. Knight, who had made any test whatever as to the actual tipping of the Grant tire in use. The test made by Mr. Knight proves nothing whatever. He applied a Grant tire with cement and ran the tire for about a week over the streets in Chicago. He testifies that the tire was held by the cement solidly in the channel after this use. This may prove either that the cement was strong enough to hold the tire in the channel for the short time during which the tire was used, or that if the tire had tipped it had restored itself to position before the cement had solidified. The latter possibility is shown by the fact that, as Mr. Knight admits (X-Q. 47, Rec. p. 455), the cement was not fully dried, even when the tire was exhibited at the time of taking his testimony. The test is entirely without probative value.

In connection with this test, it is pertinent to ask why the defendant does not cement all its tires solidly in the channels on the wheels. It would thus avoid, according to Mr. Knight, all possibility of any tipping action, and the tire would avoid the Grant patent. The defendant's conduct in persisting in the use of uncemented tires speaks louder than its assertion that it does not find any advantage in the capacity of the Grant tire to tip.

The defendant also calls attention to the fact that in some instances the Grant tires have rusted in the channel. This is absolutely immaterial, because the grip of the rust on the tire is so weak as to be easily broken by a blow from the hand, and this blow is much less than the side strains and

blows received by the tire in actual practice. The alleged rusting of a Grant tire in its channel can have no practical effect in preventing the tire from tipping and cushioning the lateral blows upon it.

Defendant's counsel seems to lay great stress on the testimony of the defendant's witnesses that, in many cases, the Grant tires are torn or cut so as to require their removal before the rubber is worn down to the flanges. It does not follow from this that the Grant tire has not the capacity for tipping, but it shows merely that the wear and tear on the tire from the side blows may have been greater than even the Grant construction can stand. It is not pretended that the Grant tire will withstand the effect of all side blows and strains, but only that it will withstand those side blows and strains more effectively than any other known form of tire, either in the art subsequent to Grant or in the art prior to Grant. This fact is abundantly proved.

The defendant tries to make something of the point mentioned in the opinion of the Court of Appeals for the Sixth Circuit, that the success of the Grant tire may be due to the use of better rubber and not to the combination of its parts. This contention is absolutely unsound. A good quality of rubber can be had by every rubber tire manufacturer in this country, and yet they all refuse to make any other than the Grant tire, and the public insists on using the Grant tire, although other forms of tires made out of equally good rubber are free to them to manufacture, and thus to avoid the danger of infringement. The persistent use of the Grant tire and the failure of competing tires, although all made of the same quality of rubber, is conclusive proof that the success of the Grant tire is due to the combination and the relation of its parts and not to the quality of rubber used.

The defendant's other suggestions, that the wide use and success of the Grant tire are due to its immobility and the

cheapness with which the channels can be manufactured, are equally fallacious. As has been abundantly pointed out, the main feature of the Grant tire is its mobility, not its immobility. If the form of channel with flaring sides used by Grant can be cheaply manufactured, so also can channels with straight sides or with converging sides be cheaply manufactured, and these latter forms are plainly outside the Grant patent and open to use by the public.

Defendant's counsel in the court below referred with much stress to the Pond drawing No. 2, in which defendant's expert, Mr. Pond, illustrated his ideas of the action of the Grant tire on smooth pavements, rough pavements, under light and heavy loads and when brought in contact with a car track. This drawing is of no probative value, being but a figment of the imagination of Mr. Pond. It represents nothing which Mr. Pond has seen and nothing which has occurred in actual practice.

Thus, the defendant's arguments, designed to show that the Grant tire is incapable of moving and yielding in its channel, are entirely unreasonable and without foundation.

The defendant says that the capacity of the Grant tire to tip and move in its channel was not urged by the complainant in the Illinois cases brought by the Rubber Tire Wheel Company against The Firestone Victor Rubber Tire Company. These cases never came to issue, and therefore the complainant had no opportunity to present this feature of the Grant patent to the court. The record before this court does not bear out the complainant's assertion, because the entire records in those Illinois cases are not in it. Only some of the depositions given on behalf of the defendants in those cases are made a part of this record. The evidence for the complainant in those cases is not before this court, and, for all that this record shows, the capacity of the Grant tire to tip might have been fully explained in the complainant's testimony.

The defendant also attempts to make much of Grant's testimony in the suits against the Columbia Pneumatic Wagon Wheel Company (Rec. pp. 577–609), arguing that as Grant did not lay stress on the capacity of his tire to tip he regarded it as an immaterial and unessential feature.

The silence of the Grant patent as to this capacity shows that the importance of the mobility of the Grant tire was not appreciated by Grant or his solicitors, and Grant's testimony suggests that Grant had not fully understood the true reasons for the success of his tire even as late as 1898, but, on the other hand, Grant's statements show that he knew of the capacity of his tire to tip, although he laid more stress on the structural character of his tire, which is all that the law required him to set forth in his patent.

On page 584 of the record, Grant, testifying in the Columbia case, plainly refers to the capacity of one side of the tire to be raised in the channel, that is, the tipping capacity.

He says:

> "I also find *on slightly raising the side of said tire*, the inside of metal flange is of the same shape and the angle caused by the sides of the unexposed and exposed sides of rubber tire are below the top of flanges of metal rim."

Grant frequently refers to the creeping of his early tires in their channels, and states that, in his opinion, it is a benefit for the tire to creep slightly. (Rec. pp. 630, 655.) If the tire creeps, it must be mobile in its channel.

Defendant's counsel also makes much of the fact that at one time Grant used common shellac for preserving the canvas on the lower side of the rubber. Grant testifies concerning this at page 651 of the record as follows:

> "We used cement at one time, but not for the purpose of keeping them (the tires) from traveling, but

for the purpose of preserving the canvas on the lower side of the rubber and *to assist in keeping the rubber tire from tipping over in the channel.*"

This testimony of Grant fully establishes the fact that Grant was aware that his tire did in fact tip although he did not appreciate the advantages of this capacity.

The use of "this cement, which was nothing more than common shellac" (Grant Rec. p. 651), was shortly afterwards abandoned and never resumed. (Grant Rec. p. 651.)

The defendant's final point is, that the Blosser & Kunkle patent No. 529,478 does not refer to the capacity of the Grant tire to tip. This is not surprising, as this patent is directed to an invention in the devices for holding the channel, the felly and the spokes together, and has nothing to do with the kind of tire employed on the wheel. The patent shows incidentally in Fig. 2 a cross-section of a tire resembling that of Grant. The defendant's argument that the Grant tire must be denied the advantage clearly proven to be inherent in it of its capacity to tip and yield to lateral strains, blows and stresses, because the Blosser & Kunkle patent, which incidentally illustrates the Grant tire, says nothing about this capacity, shows the absurd length to which the defendant is obliged to go in order to support its theory.

Even if the mobility of the Grant tire in its channel were an after discovered property which appeared only after the tires had gone into successful commercial use and had not been fully appreciated by the patentee or explained in its patent, this is rather a cause for sustaining the patent than for defeating it. The authorities which establish this point of law are referred to beginning *infra* page 66.

THE OPINION OF THE COURT OF APPEALS FOR THE SIXTH CIRCUIT.

The Court of Appeals for the Sixth Circuit held the Grant patent invalid, because on the record before it, it found that the capacity for tipping in the Grant tire was not inherent but depended upon the tension with which the wires were applied. Whether or not this finding was correct on the facts in that case is not important, because in the case at bar it has been proved, beyond the shadow of a doubt, that no matter how tightly the wires are applied the Grant tire can tip in its channel and cushion the side blows and strains.

In its opinion the Court of Appeals for the Sixth Circuit said (116 Fed. 374):

> "It is very plain that the degree, if not the very existence, of this capacity for 'side tipping', depends upon the tension of the retaining wires. To tighten the wires to their utmost tension must in the very nature of things compress the rubber beneath them as much as its elasticity will permit. It must therefore follow that Grant's retaining wires must not be tightened to the highest tension of the wires, for, if that is done, there can be no beneficial yielding of either rubber or wire under a violent lateral strain, and either the rubber must be cut by the wire, or the wire break, before there can be any 'rising' of the rubber tire on one side to meet such strain."

Basing its conclusion on this finding of fact, which may have been justified by the record before it, but which the present record shows to be altogether erroneous, the Court of the Sixth Circuit found that the capacity for tipping was not inherent in the Grant structure, and, as the Grant patent failed to point out how tight the wires should be drawn in

order to secure this beneficial tipping, determined that the patent was invalid. The Court said (p. 376):

> "We learn now that this capacity for any beneficial yielding is dependent upon the wires being properly adjusted originally, and that this proper tension depends upon the right judgment of the workman. If this tipping capacity had been pointed out, and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved, though this we need not consider. . . . Eliminating this alleged new feature, we are unable to find in Grant's combination any new mode of operation or any new result."

We have already pointed out fully in this brief (beginning *supra* p. 47) just how the Grant tire, whether of the complainants' or of the defendant's construction, tips when struck or twisted sidewise, and we have fully shown that this capacity for tipping is present when the wires are applied as tightly as it is possible to do so without breaking them (*supra* p. 47). In the Goodyear case before the Court of Appeals for the Sixth Circuit this fact was not proved, and it was not proved that the defendant's tire in that case was applied with the wires stretched to their utmost capacity. In the case at bar the wires in the defendant's tires are stretched to their utmost capacity, and yet the tire is capable of yielding and tipping in its channel, and the same has been proved of the Grant tire made by the complainants.

It is clear from the opinion of the Court of Appeals for the Sixth Circuit that if the incompleteness of the record had not caused it to err on this question of fact it would have held the Grant patent valid, for the opinion admits as correct the rule of law that, if the patentee describes his invention so fully that those skilled in the art can practice

it, he is entitled to all the benefits and uses that are inherent in the patented structure. The court said (p. 375):

> "If this capacity for side movement be a beneficial function plainly inherent in Grant's combination and arrangement of old parts in relation to each other, and not a mere 'obscure property lurking in some accidental corner of his device', it was not essential that the patentee should point it out as one of the advantages of his structure. This is because he has invented a machine, structure or manufacture which includes in its necessary mode of operation the function in question, and, whether the inventor knew or not the full measure of the beneficial functions of his structure, he is entitled to all the uses of his invention."

In thus stating the law, the court simply followed the rule laid down in *Eames* v. *Andrews*, 122 U. S. 40, in which this Court sustained a patent for a driven well, which described fully the manner of driving the well, but did not explain the mode of operation by which the water ran into the well. This is the same situation which is met in the case at bar where the Grant patent describes fully and accurately the structure invented, but fails to describe one mode of operation by which its great commercial advantage is secured.

In *Eames* v. *Andrews*, as in the case at bar, the defendant contended that the patent was void for failing to disclose the principle of operation, but the court disposed of this argument (p. 55) as follows:

> "It is to be observed that the scientific theory and principle, the application of which is supposed to constitute the invention of Colonel Green, are not set forth either in the original or reissued patents. This feature was commented upon by Mr. Justice Blatchford

in *Andrews* v. *Cross*, 19 Blatchford, 294, 305, as follows: 'It may be that the inventor did not know what the scientific principle was, or that, knowing it, he omitted, from accident or design, to set it forth. That does not vitiate the patent. He sets forth the process or mode of operation which ends in the result, and the means for working out the process or mode of operation. The principle referred to is only the why and the wherefore. That is not required to be set forth. Under § 26 of the act of July 8, 1870, 16 Stat. 201, under which this reissue was granted, the specification contains a description of the invention and of 'the manner and process of making, constructing, compounding, and using it,' in such terms as to enable any person skilled in the art to which it appertains to make, construct, compound, and use it; and, even regarding the case as one of a machine, the specification explains the principle of the machine, within the meaning of that section, although the scientific or physical principle on which the process acts when the pump is used with the air-tight tube, is not explained. An inventor may be ignorant of the scientific principle, or he may think he knows it and yet be uncertain, or he may be confident as to what it is, and others may think differently. All this is immaterial, if by the specification the thing to be done is so set forth that it can be reproduced.'"

In *Dixon-Woods Co.* v. *Pfeifer*, 55 Fed. 390, the Court of Appeals for the Second Circuit sustained the complainant's patent, saying (p. 395):

> "His patent described clearly enough the way in which bars and the operative mechanism should be constructed and operated, and the glass should be conveyed through the leer. He did not know, or he did

not tell, why the new method would produce better results. He simply told how to construct a machine which carried the glass through the leer on a level, and saved much breakage; but he ought not to lose the statutory benefits which would certainly belong to him if he had seen and described the philosophy of his machine accurately."

In *Cleveland Foundry Co.* v. *Detroit Vapor Stove Co.*, 131 Fed. 853, C. C. A. Sixth Circuit, the Court of Appeals for the Sixth Circuit sustained the patent in suit, although the specification did not describe the scientific principle on which it operated, saying (p. 855):

"And it may be that the expert witnesses have not in all respects correctly apprehended it. But if the fact be that his construction does effect the results, and they are beneficial, he is none the less entitled to the benefit of his invention though he may not have correctly understood the principles of its operation."

In *Van Epps* v. *United Box Co.*, 143 Fed. 869, the Court of Appeals for the Second Circuit sustained a patent for a screen-plate in a paper pulp machine. The court said (p. 872):

"The language of the patent fails to state any theory of the patentee as to the presence of air below the screen-plates. But where a patent discloses means by which a novel and successful result is secured, it is immaterial whether the patentee understands or correctly states the theory or philosophical principles of the mechanism which produces the new result."

In *Westmoreland Specialty Co.* v. *Hogan* (C. C. A. Third Circuit), 167 Fed. 327, the court sustained a patent for a salt dredge or cellar and said (p. 328):

"But the mere failure of a patentee to realize all the benefits and possibilities of his invention is not fatal. The after-discovery of unsuspected usefulness in a disclosed apparatus, far from detracting from its value, may serve to enhance it. It is the benefits which test, use, and time unfold that really determine merit. It is this after-test, the test of use, that proves the worthlessness of the great majority of patents and establishes the value of the few."

THE OPINIONS OF THE COURT OF APPEALS FOR THE SECOND CIRCUIT.

The Court of Appeals for the Second Circuit found, both in the Firestone case, 151 Fed. 237, and in the case at bar, 162 Fed. 892, that the capacity for tipping was inherent in the Grant patent, even if the tire was applied with the wires stretched to their utmost capacity, and that the Grant patent was valid.

In the Firestone case the court said (p. 238):

> "Grant's claims cover combinations composed of elements which, when considered separately, were all old, but which were combined by him to form a structure, which, for the first time, placed in the hands of vehicle owners a perfect rubber tire. From the crudities, oddities, total failures and partial successes which had preceded him he constructed a tire which became popular almost from its inception. This was not the result of chance or the haphazard selection of parts; his success could only have been achieved by a careful study of the scientific and mechanical problems necessary to overcome the defects which rendered the then existing tires ineffective and useless. The problems demanded the exercise of faculties far above those possessed by the skilled mechanic. Few patents have received such immediate and well-nigh unanimous recognition. For years carriage manufacturers had

been making strenuous efforts in this country and in Europe to secure a practical rubber tire. The moment Grant's structure appeared it was adopted by all the large manufacturers and to-day it is no exaggeration to say that no successful rubber tire can be made without embodying the distinguishing features of the Grant patent. Persistent efforts have been made to evade it but without success. The tire described and claimed in the Grant patent is the standard rubber tire of to-day. This popularity may be accounted for in part by the financial ability of the owners of the patent to promote sales, but it was a most inconspicuous part. The hard-headed men of trade do not place themselves in a position where they must accept the alternative of an infringement suit or the payment of license fees for the use of an article, when an equally good article may be had for nothing. It should be and is the desire of the court in approaching the consideration of a patent for a structure which has thus won a position of unchallenged supremacy in the commercial world, to endeavor to sustain rather than defeat the claims. The combination of the patent operates, we think, to produce a new result or an old result in a manner which is a vast improvement over anything in the prior art. The Grant tire has the capacity, which no other possesses, of readjusting itself, after yielding to severe lateral strain, without tearing or abrasion of the rubber or injury to any of the parts.

"The Circuit Court of Appeals found that the new mode of operation which produces this result is not mentioned in the specification or inherent in the combination but depends for its discovery upon the ingenuity of experts. Recognizing the rule that one who has invented a structure which cannot be used without including the function which produces the new result,

is entitled to all the uses of his invention whether known to him or not, the court says:

"'If this tipping capacity had been pointed out and even this indefinite direction given by the patentee as to the mode of securing that operation, the patent might possibly be saved.'

"It now appears that the feature which secures patentability is inherent in the patent, and the specification is so clear and explicit that no intelligent mechanic can follow Grant's directions without securing the tipping action which inheres in no other tire. This feature is neither an accident nor 'an obscure property'; it exists in every wheel on which is mounted a tire which follows the teaching of the patent. In view of this new aspect of the case we have no reason to doubt that on the present record the Court of Appeals of the Sixth Circuit would reach a result favorable to the patent.

"The complainant's expert says:

"'It is absolutely impossible to adjust the tension of the wires, so that this yielding capacity will not be exhibited in the tire.'

"We are convinced, in view of the new testimony, that he is correct. The specification is addressed to those skilled in the art; it is enough that they understand it. Had the patentee attempted to point out the minute details of the elements making up his combination — such as the quality and degree of elasticity of the rubber, the material, size, strength and tensility of the wires and the exact amount of force needed to draw the wires together, he would have found himself surrounded by difficulties even more serious than those which now confront him. He chose to leave these details to the intelligent operator with the assurance that such a one would possess sufficient knowledge to

draw the wires tight enough to hold the rubber firmly in the channel, but not tight enough to break them. Nothing more was required, for a tire so secured would necessarily have the capacity of reseating itself when subjected to unusual lateral strain and would infringe the claims. The entire prior art was before the skilled workman to the same extent as if written in the Grant patent, and, with this knowledge, it is hardly possible that he could set the tire so that it would fail to perform the functions referred to, unless he deliberately purposed to make a failure. On the one hand, he would know that he must not draw the wires tight enough to break them, and, on the other, that he must draw them sufficiently to hold the tire snugly in the channel. Ordinary common sense would teach him to do this, and if he neglected to exercise it he would find that in one case the wires would break and in the other that the tire would rock, and, if subjected to any unusual jolt, would roll out of the channel. That the capacity for readjusting itself when subjected to lateral strain is inherent in the Grant tire seems perfectly plain, and was demonstrated at the argument even by hand pressure applied to the tire at a point where the rubber had been cut down so as to expose the wires. Indeed, the defendant's expert says:

> "'There is no doubt that when lateral pressure is applied to one side of the exposed portion of the tire, there is a tendency to roll the tire out of the channel. The element which materially resists this tendency is that retaining-wire on the side to which the pressure is applied. If this wire is sufficient to resist the strain, the tire cannot roll out of the channel; and the function of the other retaining-wire, at the opposite side of the tire, is simply to hold that part of the tire in its place, in order that

it may be prepared, in its turn, to receive lateral thrust from the opposite side.'

"Without discussing the subject further we are satisfied that the description of the patent is sufficiently full, clear, concise and exact to enable a person skilled in the art to make the Grant tire. We are also convinced that the new and useful tipping and reseating feature is inherent in the structure and that it was not necessary to point it out specifically, for the reason that no intelligent mechanic in the rubber tire art could follow the teachings of the patent without producing a tire possessing this function."

In the case at bar the Court of Appeals for the Second Circuit replied to the defendant's arguments as follows (Rec. p. 682):

"The impossibility of proving or disproving in any satisfactory manner the existence of this tipping tendency by the observation of the vehicle in actual use or the examination of a worn-out tire, will be admitted after a moment's reflection. The human eye cannot detect the movement of the tire when driven rapidly against a trolley rail or other obstruction at an angle of 45 degrees. So too a worn-out tire with cuts and abrasions along its entire periphery may have the tipping capacity in question. The fact that tires have been produced in court which were rusted in the steel channel, is not important unless it be proved that they were subjected to severe lateral strain.

"A tire used on asphalt pavements or on smooth park roads would probably remain in place if but one wire were used. We do not lose sight of the fact that the testimony shows that many of the tires from Chicago received rough usage but this testimony avails little in face of the experiment which showed us the bottom of the tire rolled up by lateral strain and re-

seated the moment the strain was removed. This record presents nothing new which would warrant us in changing our former decision.

"Another volume of 500 pages has been added to the library which has accumulated during the last ten years through the efforts of many defendants who seem determined to use what they, in effect, assert to be a useless device. The indomitable persistency with which these people have fought for the right to use the Grant tire is more persuasive evidence of its merits than the opinions of experts.

"If the Willoughby, Latta and other tires are as good as Grant's why do not these defendants use them? The almost frantic efforts which have been made to use the Grant tires are inconsistent with the argument that they show no inventive genius and we are more and more convinced that we were right when we said that 'no successful rubber tire can be made without embodying the distinguishing features of the Grant patent'."

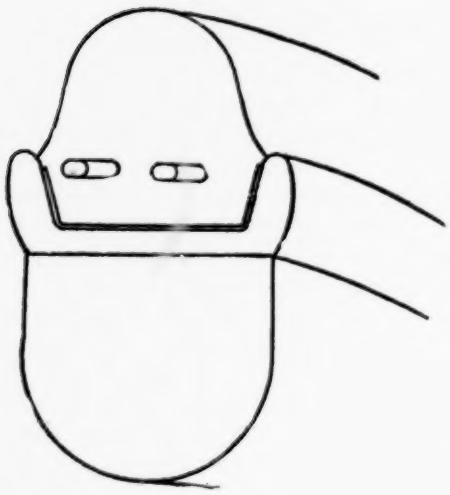
INFRINGEMENT.

The fact of infringement was proved by the sale of a rubber tire by the defendant's agent in the city of New York. This tire is produced in evidence, and is marked "Complainant's Exhibit Defendant's Rubber Tire". The tire was assembled and sold by the Diamond Rubber Company of New York, February 28, 1907, some months before the bill of complaint was filed. (R. pp. 9, 10, 28 and 21.) We show herewith a cut of the cross-section of defendant's rubber tire, which shows all the elements of the claims in the patent with the exact limitations specified by the claims.

In the words of Grant's first claim, the defendant's tire is in combination: —

"a vehicle wheel having a metallic rim with angularly

Deft's Rubber Tired Wheel.



projecting flanges to form a channel or groove with tapered or inclined sides."

It is —

"a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges."

It has —

> "independent retaining-wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges."

These three elements, the metallic rim, the rubber tire and the independent retaining wires, are all "substantially as described" in the Grant patent.

The defendant's tire, therefore, is substantially identical with the specific tire described in the Grant patent and infringes the first claim thereof.

The second claim of the Grant patent is for the same elements as the first claim, with the addition of "a reinforcing strip of fibrous material placed at the bottom of said tire and wholly within said flanges". This reinforcing strip the defendant's tire also has. It, therefore, infringes the second claim of the Grant patent.

There is no substantial contention that the defendant's tire does not infringe the Grant patent. The distinctions which the defendant's expert is able to point out are not substantial differences, but are of the most trivial nature. He finds that the angle between the exposed and unexposed portion of defendant's tire is 162°, whereas the angle in the Grant patent is 137°. This is certainly immaterial, as all the advantages of the angle in the Grant tire are found in the defendant's tire. The claims do not call for any specific angle, but merely that there should be an "an angle". The defendant's expert also says that the tops of the holes for the wires "are just about on a line connecting the outer periphery of the flanges". Even if this were so (and it does not appear to be the fact from an inspection of the tire), it is not denied that the retaining wires are "within the outer peripheries of the flanges", and this is all that the claim requires. These flimsy differences are not worthy of further consideration.

The defendant's tire, therefore, is a clear infringement of the Grant patent.

The defence of non-infringement was not seriously urged in the courts below. Judge Holt, in his opinion (Rec. p. 671), said:

> "Of course if your defence was that this defendant does not infringe, that would be an entirely different question, but the only question argued here is as to the validity or invalidity of the patent."

CONCLUSION.

In conclusion we respectfully submit:

First, that the Grant tire is a new and useful combination of elements which has superseded all other forms of tires for certain classes of vehicles, and which has been widely copied by all tire manufacturers and users of solid rubber tires. All other forms of tires for these classes of vehicles have been discarded.

Second, that the beneficial function of the capacity of the Grant tire to cushion lateral strains and blows by tipping and yielding its channel has been fully demonstrated and proved in the record before this Court.

Third, that this capacity for tipping in the Grant tire is inherent in the tire, and is present even if the wires are strained to their utmost in applying the tire. The Court of Appeals for the Second Circuit found this to be a fact on the record before this Court.

Fourth, that the Court of Appeals for the Sixth Circuit, because of the incompleteness of the record before it, was lead into the error of finding that the capacity of the Grant tire to tip depended upon the tension of the wires, and therefore its decision, based on that finding, that the Grant patent was invalid was wrong.

Fifth, that the defendant's tire infringes the Grant patent.

We respectfully submit that the decision of the Court of Appeals for the Second Circuit should be sustained and the decree that the Grant patent is valid and infringed should be affirmed.

C. W. Stapleton

FREDERICK P. FISH,
STALEY & BOWMAN,
J. L. STACKPOLE,
Counsel for Respondents, Complainants.

ADDENDA.

The patents of the prior art are discussed by the complainant's expert, Mr. Livermore, in the record, as follows:

Beirsmith,	No.	424,452,	Rec. p.	752
Coops,	"	20,678,	"	757
Elliott,	"	440,701,	"	737
Elliott,	"	440,702,	"	740
Everett (Swiss),	"	8,120,	"	749
Grant & Jeffrey,	"	470,483,	"	748
Green,	"	169,100,	"	732
Kearsley (British),	"	4,352 of 1883,	"	756
Kelley,	"	321,819,	"	750
Kelley,	"	362,514,	"	750
Latta,	"	341,811,	"	745
Lenton (British),	"	14,812 of 1890,	"	754
Owen,	"	365,091,	"	755
Rodgers,	"	539,826,	"	738
Timberlake (British),	"	20,706 of 1890,	"	737
Welch (British),	"	14,563 of 1890,	"	735
Willoughby (British),	"	5,924 of 1892,	"	743
Willoughby (British),	"	18,030 of 1892,	"	753
Woodward,	"	443,735,	"	750

DIAMOND RUBBER COMPANY OF NEW YORK *v.* CONSOLIDATED RUBBER TIRE COMPANY.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT.

No. 36. Argued February 28, March 1, 1911.—Decided April 10, 1911.

Where a device possesses such amount of change from the prior art as to receive approval of the Patent Office, it is entitled to the presumption of invention which attaches to a patent.

An inventor is entitled to all that his patent fairly covers, even though its complete capacity is not recited in the specifications and was unknown to the inventor prior to the patent issuing.

The law regards a change as a novelty, and the acceptance and utility of the change as further evidence, even as a demonstration, of novelty.

The rubber carriage tire involved in this case and patented to Grant attained a degree of utility not reached by any prior patent, and, although only a step beyond the prior art, is entitled to be patented as an invention.

Utility of a device may be attested by litigation over it showing and measuring the existence of public demand for its use.

While extensive use of an article beyond that of its rivals may be induced by advertising, where the use becomes practically exclusive a presumption of law will attribute that result to its essential excellence and its superiority over other forms in use.

Elements of a combination may all be old, for in making a combination the inventor has the whole field of mechanics to draw from. *Leeds & Catlin Co.* v. *Victor Talking Machine Co.*, 213 U. S. p. 318.

On the evidence this court finds that the improvement on rubber tires involved in this case possesses the power ascribed to it by the inventor and denied by those using it without authority, and holds that this power was not the result of chance but was achieved by careful study of scientific and mechanical problems necessary to overcome defects in all other existing articles of that class.

In the courts below defendants relied on invalidity of complainant's patent, and did not press the defense of non-infringement, and also conceded that infringement existed in prior litigation, and this court holds that infringement exists.

Quære whether under *Kessler* v. *Eldred*, 206 U. S. 285, the injunction can extend to sale of articles in other circuits in which complainant's patent has been held invalid.

157 Fed. Rep. 677, and 162 Fed. Rep. 892, affirming 147 Fed. Rep. 739, affirmed.

THE facts, which involve the validity of certain letters patent for improvement in rubber tires, are stated in the opinion.

Mr. Charles K. Offield for petitioner.

Mr. Frederick P. Fish, with whom *Mr. C. W. Stapleton* and *Mr. J. L. Stackpole* were on the brief, for respondents.

MR. JUSTICE MCKENNA delivered the opinion of the court.

Writ of certiorari to review a decree of the Circuit Court of Appeals for the Second Circuit sustaining a patent for an improvement in rubber tires issued to Arthur W. Grant, February 18, 1896. The patent, and those which it is contended anticipate it, have received full exposition in the opinion of that court. 157 Fed. Rep. 677, and 162 Fed. Rep. 892, affirming 147 Fed. Rep. 739. It and they were also passed upon and the patent sustained in *Rubber Tire Wheel Co.* v. *Columbia Pneumatic Wagon Wheel Co.*, 91 Fed. Rep. 978, and in *Consolidated Rubber Tire Co.* v. *Finlay Rubber Tire Co.*, 116 Fed. Rep. 629; *Consolidated Rubber Tire Co.* v. *Firestone Tire and Rubber Co.*, 151 Fed. Rep. 237. See also *Rubber Tire Wheel Co.* v. *Milwaukee Rubber Works*, 142 Fed. Rep. 531, 533, and the same case, 154 Fed. Rep. 358, 362. It was held invalid in *Goodyear Tire & Rubber Co. et al.* v. *Rubber Tire Wheel Co.* (C. C. App. Sixth Circuit), 116 Fed. Rep. 363, reversing the Circuit Court, Judge Wing presiding. It was also declared invalid in *Rubber Tire Wheel Co.* v. *Victor Rubber Tire Co.*, 123 Fed. Rep. 85, following 116 Fed. Rep. 363, *supra*.

A further display of the patent and of its alleged anticipating devices would seem to be unnecessary, and that we might immediately take up a review of the divergent decisions. There is a controversy as to whether they are divergent and irreconcilable in fundamental conceptions of the patent as well as in result.

We may say at the outset of this asserted conflict between the cases that the Court of Appeals for the Second Circuit considered that there was no antagonism between its decision and that of the Court of Appeals for the Sixth Circuit. It proceeded, as it in effect said, upon "new facts and features which have been added to or developed from the records in the earlier cases." However, something more is required of us than the reconciliation of other cases, some consideration of the patent and the state of the art prior to it.

The patent was issued to Arthur W. Grant, February 18, 1896, and he declares in the specification he has invented "certain new and useful improvements in rubber tire wheels . . . designed for use on ordinary vehicles, such as wagons, buggies, and carriages, . . . and consist in the construction of parts hereinafter described and set forth in the claim." The claims are as follows:

"1. A vehicle-wheel having a metallic rim with angularly-projecting flanges to form a channel or groove with tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said groove or channel and the outer portion having sides at an angle to the inner portion, the angle or corner between the outer and inner portions being located within the outer periphery of the flanges, and independent retaining-wires passing entirely through the inner portions of said tire and also within the outer peripheries of the flanges, substantially as described.

"2. A vehicle-wheel having a metallic rim with outwardly-projecting flanges at an angle to the plane of said

wheel so as to form a channel or groove having tapered or inclined sides, a rubber tire, the inner portion of which is adapted to fit in said tapered groove or channel, and the outer or exposed portions formed at an angle thereto, the angle or corner between the said portions being placed within the outer periphery of said flanges, openings extending entirely through the unexposed portion of said tire, and independent retaining-wires in said openings, and a reinforcing-strip of fibrous material placed at the bottom of said tire and wholly within said flanges, substantially as specified."

It will be observed that the tire is composed of three elements: First, the channel or groove with tapered or inclined sides; second, the rubber tire adapted to fit into the channel or groove, and shaped as described; third, the fastening device, that is, the independent retaining wires located as indicated.

The shape and relation of the parts are illustrated in the following figures (see p. 432) taken from the patent:

Fig. 1

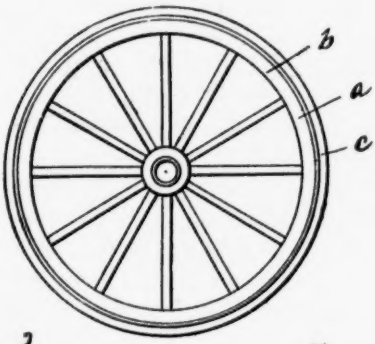


Fig. 2.

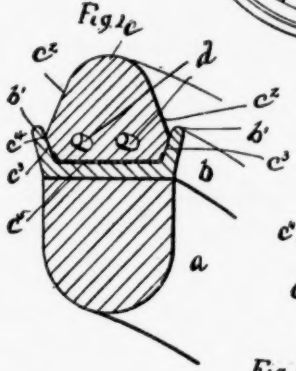


Fig. 4.

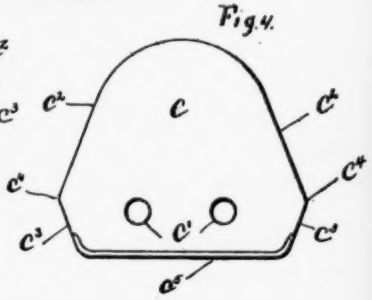
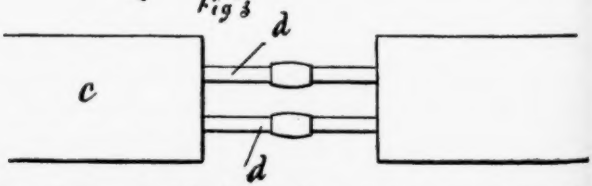


Fig. 3



These figures explain themselves, but we copy the following from the specifications:

"In the accompanying drawings, Fig. 1 is a side elevation of a wheel embodying my invention. Fig. 2 is a sectional elevation of the wheel-rim, shown partly in perspective. Fig. 3 is a partial longitudinal section through the tire, showing the openings for the retaining wires.

Fig. 4 is a transverse sectional view of the rubber tire in detail."

It is conceded that the claims are narrow, counsel saying that they are "limited closely to the specific construction of the Grant tire as it is actually shown and described in the patent." And a right to equivalents is disclaimed. Indeed, a certain merit is made of this as exhibiting at once the simplicity and perfection of the invention and the tribute paid to its excellence by respondent by exactly imitating it, instead of attempting to evade it. It is pointed out that the co-action of the parts is so dependent upon their shape and relation that any alteration destroys their coöperation and the utility of the tire. There is strength in the contention, as we shall presently see.

Anticipating somewhat, we may say that the tire has utility is not disputed; to what its utility is to be attributed is in controversy. The respondents, the Tire Company, contend that the tire is at once firm and mobile in its channel, "creeps" (moves slowly around the edge of the rim), and will yield laterally, and thus the lateral blows against it will be cushioned. It is further contended that if the tire be "tipped from its seat in the channel by a side blow" it "automatically restores itself to normal position when the side pressure is released." In other words, and in the language of one of the expert witnesses, the tire has the capacity to rise and fall and reseat itself under lateral strain, that is, to rise slightly from the rim on one side, independently of the other, when subjected to very great strain, and immediately reseat itself when such strain is removed. "It must be borne in mind," counsel say, "that the Grant tire is not cemented into the channel. This is an essential and important point. Any tire that is cemented in its channel is rigid and cannot 'creep' or yield to lateral blows. It is, therefore, easily and quickly destroyed. The absence of cement in the Grant tire is a vital characteristic." And, further, that Grant,

"by omitting the cement and by permitting the tire to tip, to creep and to move in its channel, obtained a radically new and useful result." And it is insisted that this results because the tire is a new and patentable combination of parts co-acting in the manner of a true combination to produce a new and useful result, and is not an aggregation of old elements or parts each performing its own function and nothing more. These propositions are combated by the Rubber Company, and it is insisted that the testimony is "conclusive and uncontradicted that the Grant tire, clamped to the tire or rim by the straining tension of the two wires," has not the capacity attributed to it, "and never could have." And it is said that "it is manifest that this question can be easily determined as a question of fact," and that the testimony "proves such asserted movement a myth and a fallacy." And, it is urged, that such capacity in the tire is not recited in the specifications of the patent, and was unknown to Grant.

This tipping capacity is made the pivot of the controversy. It was as to that that the Courts of Appeals for the Sixth and Second Circuits disagreed either upon the difference of the testimony in the cases, or more deeply, on principle. The controversy and Grant's alleged ignorance of the tipping characteristic of the tire really present some anomaly. The tire has utility, a utility that has secured an almost universal acceptance and employment of it, as will subsequently appear. It was certainly not an exact repetition of the prior art. It attained an end not attained by anything in the prior art, and has been accepted as the termination of the struggle for a completely successful tire. It possesses such amount of change from the prior art as to have received the approval of the Patent Office, and is entitled to the presumption of invention which attaches to a patent. Its simplicity should not blind us as to its character. Many things,

and the patent law abounds in illustrations, seem obvious after they have been done, and, "in the light of the accomplished result," it is often a matter of wonder how they so long "eluded the search of the discoverer and set at defiance the speculations of inventive genius." *Pearl* v. *Ocean Mills*, 11 Off. Gaz. 2. Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any, and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skillful attention. But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. It regards a change as evidence of novelty, the acceptance and utility of change as a further evidence, even as demonstration. And it recognizes degrees of change, dividing inventions into primary and secondary, and as they are, one or the other, gives a proportionate dominion to its patent grant. In other words, the invention may be broadly new, subjecting all that comes after it to tribute (*Railway Co.* v. *Sayles*, 97 U. S. 554, 556); it may be the successor, in a sense, of all that went before, a step only in the march of improvement, and limited, therefore, to its precise form and elements, as the patent in suit is conceded to be. In its narrow and humble form it may not excite our wonder as may the broader or pretentious form, but it has as firm a right to protection. Nor does it detract from its merit that it is the result of experiment, and not the instant and perfect product of inventive power. A patentee may be baldly empirical, seeing nothing beyond his experiments and the result; yet if he has added a new and valuable article to the world's utilities he is entitled to the rank and protection of an inventor. And how can it take from his merit that he may not know all of the forces which he has brought into operation? It is certainly

not necessary that he understand or be able to state the scientific principles underlying his invention, and it is immaterial whether he can stand a successful examination as to the speculative ideas involved. *Andrew* v. *Crocc*, 8 Fed. Rep. 269; *Eames* v. *Andrews*, 122 U. S. 40, 55; *St. Louis Stamping Co.* v. *Quinby*, 16 Off. Gaz. 135; *Dixon Wood Co.* v. *Pfeifer*, 55 Fed. Rep. 390; *Cleveland Foundry Co.* v. *Detroit Vapor Stove Co.* (C. C. A. Sixth Circuit), 131 Fed. Rep. 853; *Van Epps* v. *United Box Co.* (C. C. A. Second Circuit), 143 Fed. Rep. 869; *Westmoreland Specialty Co.* v. *Hogan* (C. C. A. Third Circuit), 167 Fed. Rep. 327. He must, indeed, make such disclosure and description of his invention that it may be put into practice. In this he must be clear. He must not put forth a puzzle for invention or experiment to solve but the description is sufficient if those skilled in the art can understand it. This satisfies the law, which only requires as a condition of its protection that the world be given something new and that the world be taught how to use it. It is no concern of the world whether the principle upon which the new construction acts be obvious or obscure, so that it inheres in the new construction.

This discussion may be broader than the contention of the Rubber Company requires; indeed, may imply a misunderstanding of it. The contention may only mean that Grant did not discern the manner of the operation of the elements which he combined, and therefore did not really invent any thing, only assembled old elements, changing their relations somewhat and retaining their essential character and effect. We should be slow to infer such ignorance. It is difficult to suppose that the contriver of a successful device did not understand how it operated; that he saw nothing in it and committed it to the world without seeing anything in it, but a composition of wood, rubber and iron in certain relations without understanding or attempting to discover the law and principle of its or-

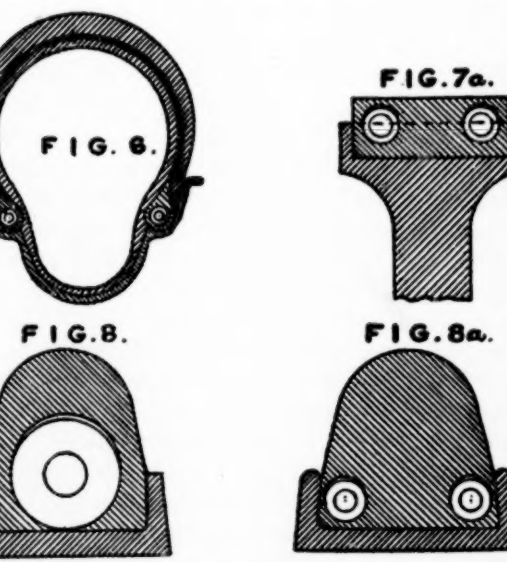
ganization and efficiency. Grant's situation demanded caution and knowledge. He was confronted by what has been termed a "crowded" prior art; he might expect to encounter litigation, and, even before litigation, he would have to satisfy the Patent Office of the novelty and utility of his device, and it is hard to believe that he did not know the coöperating law of the elements which he had combined and only unconsciously made use of it. We find the contention difficult to handle. When a person produces a useful instrument, to say that he did not know what he was about is at least confusing. To take from him the advantage of it upon nice speculation as to whether it was an ignorant guess or confident knowledge and adaptation, might do him great injustice. His success is his title to consideration.

In our decision thus far we have assumed that the Grant tire is an invention, but as that is disputed we must examine its right to such distinction. The Rubber Company denies invention to it, and, considering that its pretension to such quality depends upon the possession of tipping power (including in this reseating power), contests the existence of such power; and, even granting its existence, it is yet contended that anticipation may be demonstrated. In other words, it is insisted that if tipping power exist in the Grant patent it existed in prior patents, and that "the old art was crowded with numerous prototypes and predecessors of this Grant tire, with every thought and suggestion of novelty and utility that can be found in drawings and specifications of the Grant patent, or in the idealized contentions as to the patent by the visions and dreams of the experts and counsel for the patent."

Two patents are selected to sustain the contention, out of what are said to be a large number of United States and foreign patents, with the comment that "if they do not show anticipation none of the others will show it, and if they do anticipate the Grant patent, it is entirely im-

material whether the others do or not." They are bo
English patents issued to Frank Stanley Willoughby. W
copy from the Rubber Company's brief the figures of th
patent 5924.

FIG. 3



The following is the explanation given by counsel of th
figures:

"The drawings of the Willoughby patent of March 2
1892, No. 5,924, as to the flanged channel, show the flange
in three different positions as to the solid rubber tir
Fig. 8 shows the flange at right angles of the rim; Fig. 8

shows the flanges somewhat inwardly inclined with the two retaining wires, and Fig. 7[a] shows the flanges vertical with two retaining wires, the retaining wires in Fig. 8[a] being below the outer periphery of the flanges, and the two retaining wires of Fig. 7[a] being centrally located, as to their openings, with the periphery of the flanges. In Fig. 6, however, which is a pneumatic tire (a tire when highly inflated is as solid as a rubber tire) the flanges are outwardly flaring and the two retaining wires are substantially below the periphery of the flanges."

There are resemblances and differences in the figures to those of the Grant patent and we have let the Rubber Company set forth the resemblances. The differences are substantial. To represent them we cannot do better than to quote the description given of them by Judge Thomas, 91 Fed. Rep. 988, as follows:

"The Willoughby patent, No. 5,924, Fig. 8[a], shows in combination wire connections, also described in the specification, very similar, save in location, to those used by Grant, and the figure shows also a very slight angle located slightly within the flanges. The rim, however, is of the clinger variety; that is, the flanges incline inwardly, and bind the rubber on each side. Such a tire thwarts the lateral play otherwise permitted to the rubber by the wires, and, although almost imperceptible angles appear, made by the sides of the rubber, they are not sufficient to give the immunity resulting from a well-defined angle whose vertex is within the flaring rim. Figures 5[a] and 5[c] show rims shaped like the segment of a circle, in which are seated spherical rubbers held in place by a single wire. The rim is described in the specifications as U or V-shaped. A V-shaped rim must have flaring flanges, but the rim is quite unlike that employed by Grant, and in the entire absence of the angle the functions attributed to the Grant tire seem to be absent. Indeed, the freedom of action permitted by the wire in the rim used by Grant seems to

be denied the tire, for the reason that the rubber is confined by the V-shaped channel.

"The Willoughby patent, No. 18,030, shows wire connection, flaring flanges and angle, (see Figs. 26, 30, 31,) and in mere coincidence of parts seems to be the nearest approach to the Grant tire. But look at these figures, and all possible conception of coincidence of function is dissipated at once. There is the flaring rim, in which is seated a rubber upon which is placed a steel outer tire, through which pass the openings and wires. The angle is far without the upper edges of the rim, and it appears that neither function ascribed to the Grant tire is obtained."

Willoughby patent No. 18,030, has no relevancy whatever. It is true it has flanges upon the rim, flaring and at right angles, and it is illustrated by figures showing what may be called retaining wires, to quote from the brief of counsel, "above the periphery of the flanges, another substantially on a line with the periphery of the flanges, and three of the figures showing the retaining wires substantially below the periphery of the respective flanges." It is manifest that the relation of the retaining wires to the periphery of the flanges is absolutely unimportant in the tire. Willoughby, describing his invention, says: "The object of my present invention is as in my previous one to provide a metallic outer tyre or armour to rubber which is of itself flexible." The retaining wires hold the metallic exterior to the rubber bed.

The utility of the Grant patent, therefore, was not attained in the Willoughby patent. The Rubber Company's conduct is confirmation of this. It uses the Grant tire, as we shall presently see, not the Willoughby tires. Let it be granted that they afforded suggestions to Grant, and that he has gone but one step beyond them. It is conceded, as we have said, that his invention is a narrow one—a step beyond the prior art—built upon it, it may

be, and only an improvement upon it. Its legal evasion may be the easier, (*Railway Co.* v. *Sayles, supra*), and hence we see the strength of the concession to its advance beyond the prior art and of its novelty and utility by the Rubber Company's imitation of it. The prior art was open to the Rubber Company. That "art was crowded," it says, "with numerous prototypes and predecessors" of the Grant tire, and they, it is insisted, possessed all of the qualities which the dreams of experts attributed to the Grant tire. And yet the Rubber Company uses the Grant tire. It gives the tribute of its praise to the prior art; it gives the Grant tire the tribute of its imitation as others have done. And yet the narrowness of the claims seemed to make legal evasion easy. Why, then, was there not evasion by a variation of the details of the patented arrangement? Business interests urged to it as much as to infringement. We can find no answer except that given by the Tire Company: "The patented organization must be one that is essential. Its use in the precise form described and shown in the patent must be inevitably necessary."

That the tire is an invention is fortified by all of the presumptions, the presumption of the patent by that arising from the utility of the tire. And we have said that the utility of a device may be attested by the litigation over it, as litigation "shows and measures the existence of the public demand for its use." *Eames* v. *Andrews, supra.* We have shown the litigation to which the Grant tire has been subjected.

We have taken for granted in our discussion that the Grant tire immediately established and has ever since maintained its supremacy over all other rubber tires and has been commercially successful while they have been failures. The assumption is justified by the concession of counsel. They do not deny the fact, but attribute it to "three subsequent discoveries and conditions" since the

Grant patent, these being—(1) "that the tire can be held in place and fixed upon its base by straining the wires to a clamping point; (2) the production, by mechanical means, cheaply and expeditiously as a commercial product, of the channel rim in straight lengths to be applied to the wheel; and (3) the improvement of the rubber itself; the demand of the public for a solid rubber tire, and the wealth of the complainant, advertising in the market, and pushing and exploiting the tire."

The first ground is a somewhat distant assertion that the tire does not involve invention, but as to that we have sufficiently expressed opinion. The second ground is an inversion of cause and effect, and there is an obvious answer to the third ground. Without suitable rubber, there could have been no rubber tires, and the desire for them necessarily induced their manufacture, and Grant exercised invention to produce an efficient one. We can understand that some advertising was necessary to bring it into notice, and give it a certain use, but the extensive use which it attained, and more certainly the exclusive use which it attained, could only have been the result of its essential excellence, indeed, its pronounced superiority over all other forms. Here, again, in our discussion a comparison is suggested between it and other tires, and the inquiry occurs why capital has selected it to invest in and advertise and not one of the tires of the prior art if it be not better than they? But the effect of advertising is mere speculation; to the utility and use of an article the law assigns a definite presumption of its character, as we have seen, and which we are impelled by the facts of this record to follow.

To what quality the utility of the tire may be due will bear further consideration, if for no other reason than the earnest contentions of counsel. Aside from those contentions and the ability by which they are supported, we might point to what it does as a demonstration of its dif-

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ference from all that preceded it, that there is something in it, attribute or force, which did not exist before—something which is the law of its organization and function, and raises it above a mere aggregation of elements to a patentable combination. And we may say in passing the elements of a combination may be all old. In making a combination the inventor has the whole field of mechanics to draw from. *Leeds & Catlin* v. *Victor Talking Machine Co.*, 213 U. S. at page 318.

The Tire Company gives a definition of the "something" as tipping and reseating power. The Rubber Company earnestly denies the existence of the power, and, as we have seen, the Courts of Appeals for the Sixth and Second Circuits divided in opinion on its existence. We think such power is possessed by the tire. This is shown by the evidence, and was shown at the oral argument. And it is the result of something more than each element acting separately. It is not the result alone of the iron channel with diverging sides, nor alone of the retaining bands or the rubber. They each have uses and perform them to an end different from the effect of either, and they must have been designed to such end, contrived to exactly produce it. There can be no other deduction from their careful relation. The adaptation of the rubber to the flaring channel, the shape of that permitting lateral movement and compression, the retaining band, holding and yielding, placed in such precise adjustment and correlation with the other parts, producing a tire that "when compressed and bent sidewise shall not escape from the channel and shall not be cut on the flange of the channel," and yet shall "be mobile in the channel." We agree with the Court of Appeals that "this was not the result of chance or the haphazard selection of parts; his (Grant's) success could only have been achieved by a careful study of the scientific and mechanical problems necessary to overcome the defects which rendered the then existing tires

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ineffective and useless." This conclusion is not shaken by the testimony and argument urged against it.

The contention of non-infringement is very hesitatingly advanced, suggested rather than urged. It is conceded that infringement existed in the prior litigations, but it is said that if under the closer analysis of the Grant patent "as here presented, and as considered as contended for, if to be confined to exact angles and relations of angles and precise configuration of parts"—the Rubber Company's device does not infringe. And this is attempted to be supported by the testimony of a witness who found, he said, in the Rubber Company's tire "the three fundamental mechanical elements" of the Grant patent in suit which, he interjected, were borrowed by Grant, "both individually and in combination, from the prior art long antedating his alleged invention," and then proceeded to declare a difference between the "angles and relations of angles and precise configuration of parts," to use counsel's language, of the two tires and briefly summarizing his conclusion, said that he did not "find the alleged invention, combinations and devices of either of the claims of the Grant patent in suit embodied in or contained in either of the exhibits introduced in evidence professing to represent the defendant's tire." We are unable to concur in the conclusion. The exhibits demonstrate the contrary. And we are fortified in this by the conduct of the Rubber Company in the Circuit Court. The defense of non-infringement was not there seriously urged. After considering to what extent the case, as presented, differed from the prior litigation, Judge Holt said: "Of course, if your defense was that this defendant does not infringe, that would be an entirely different question, but the only question argued here is as to the validity of the patent." In the opinion of the Court of Appeals non-infringement received no attention, presumably because that defense was not pressed upon it.

The final contention of the Rubber Company is that the Grant patent having been declared invalid by the Circuit Court of Appeals for the Sixth Circuit and by the Circuit Court for the District of Indiana in the Seventh Circuit, the Rubber Company should not have been enjoined from the handling or sale of tires manufactured in the Sixth and Seventh Circuits, and cites *Kessler* v. *Eldred*, 206 U. S. 285.

The Court of Appeals practically reserved the question. It modified the decree of the Circuit Court so far as it prevented the handling, using or selling tires and rims authorized by any judicial decree, recognizing, as it said, the applicability of *Kessler* v. *Eldred*. But it further said:

"Whether it should be given a broader interpretation is a question upon which we express no opinion, deeming it more prudent to wait until the facts are fully developed.

"There is no occasion for attempting at this time to anticipate the future and to provide for a contingency which may not arise. . . . To provide in a decree that the defendant is not enjoined from making, using and selling devices which do not infringe or which have been licensed, seems unnecessary. The doctrine of Eldred and Kessler, if carried to the extent contended for by the defendant, will introduce radical and far-reaching limitations upon the rights of patentees. These questions may not arise in the case at bar, but if they should, the court should have the facts, and all the facts, before attempting to decide them."

We concur in these remarks.

Decree affirmed.

MR. JUSTICE DAY and MR. JUSTICE LURTON took no part in the decision.